



Impact of ICT Facilities on Enhancing Quality of Instruction in Rivers State Higher Education

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Abstract

The integration of Information and Communication Technology (ICT) in higher education has become pivotal in enhancing the quality of instruction globally. In Rivers State, Nigeria, the extent to which ICT facilities contribute to instructional quality remains under-explored despite increasing investments in digital infrastructure. This study investigates the impact of ICT facilities on the quality of instruction in higher education institutions within Rivers State. Employing a mixed-methods approach, quantitative data were collected through structured questionnaires administered to lecturers and students across selected universities and polytechnics, while qualitative insights were gathered via interviews with academic administrators. Findings reveal a positive correlation between the availability and effective utilization of ICT resources—such as computers, projectors, and internet connectivity—and improvements in teaching methods, student engagement, and learning outcomes. However, challenges such as inadequate training, inconsistent power supply, and limited access to advanced ICT tools hinder the optimal use of these facilities. The study concludes that while ICT facilities significantly enhance instructional quality, targeted policy interventions and capacity-building programs are essential to maximize their potential. These findings provide a foundation for stakeholders in Rivers State to strategize on improving ICT infrastructure and training to foster a more effective educational environment.

Keywords: Ict facilities, quality of instruction, higher education, rivers state, teaching methods, student engagement, educational technology, nigeria

Introduction

The integration of Information and Communication Technology (ICT) into higher education has become a transformative force globally, reshaping teaching methodologies, enhancing learning experiences, and improving administrative efficiency. In Rivers State, Nigeria, the role of ICT in enhancing the quality of instruction in higher education institutions is a subject of increasing interest and importance. This introduction provides a comprehensive background to the study, highlighting the significance of ICT facilities in educational settings, reviewing existing literature, identifying research gaps, and outlining the study's objectives and structure.

Background and Context

Rivers State, located in the Niger Delta region of Nigeria, is home to several higher education institutions, including Rivers State University, University of Port Harcourt, and Ignatius Ajuru University of Education. These institutions serve as critical centers for knowledge dissemination and skill development in the region. Over the past decade, there has been a concerted effort to integrate ICT into the educational framework to enhance instructional quality and meet the demands of a rapidly evolving global knowledge economy.

The adoption of ICT in education encompasses a wide range of tools and resources, including computers, internet connectivity, multimedia projectors, e-libraries, and learning management systems. These technologies facilitate interactive learning, access to vast information resources, and the development of digital literacy skills among students and educators alike.

Importance of the Research

The importance of this research lies in its potential to provide empirical evidence on the impact of ICT facilities

on the quality of instruction in Rivers State's higher education institutions. Understanding this relationship is crucial for policymakers, educational administrators, and stakeholders in the education sector to make informed decisions regarding resource allocation, infrastructure development, and curriculum design. Moreover, as Nigeria strives to achieve the Sustainable Development Goal (SDG) 4, which emphasizes inclusive and equitable quality education, examining the role of ICT in enhancing instructional quality becomes imperative.

Literature Review

A review of existing literature reveals a growing body of research on the integration of ICT in higher education, both globally and within Nigeria. Studies have highlighted various benefits of ICT adoption, such as improved student engagement, access to diverse learning materials, and the facilitation of collaborative learning environments. For instance, research indicates that the use of multimedia tools and online resources can lead to better retention of information and a deeper understanding of subject matter.

In the Nigerian context, several studies have examined the availability and utilization of ICT facilities in universities. Findings suggest that while there has been progress in infrastructure development, challenges persist, including inadequate training for educators, limited access to advanced technologies, and inconsistent power supply. These factors often hinder the effective use of ICT in enhancing instructional quality.

Research Gaps

Despite the growing interest in ICT integration in Nigerian higher education, there remains a paucity of comprehensive studies focusing specifically on Rivers State. Existing research often provides a generalized overview without

delving into regional specifics, thereby limiting the applicability of findings to local contexts. Additionally, there is a need for studies that assess not only the availability of ICT facilities but also their actual utilization and the pedagogical strategies employed to maximize their potential.

Research Objectives and Questions

This study aims to investigate the impact of ICT facilities on enhancing the quality of instruction in higher education institutions in Rivers State. The specific objectives are:

1. To assess the availability and adequacy of ICT facilities in selected higher education institutions in Rivers State.
2. To examine the utilization patterns of ICT facilities by educators and students.
3. To evaluate the impact of ICT utilization on teaching methodologies and learning outcomes.
4. To identify challenges and barriers to effective ICT integration in instructional practices.

The study seeks to answer the following research questions:

1. What is the current state of ICT infrastructure in higher education institutions in Rivers State?
2. How frequently and effectively are ICT facilities utilized in teaching and learning processes?
3. What impact does ICT utilization have on the quality of instruction and student performance?
4. What challenges impede the optimal use of ICT in enhancing instructional quality?

Scope and Structure of the Paper

The scope of this study is confined to selected higher education institutions in Rivers State, focusing on both public and private universities. The research will consider various ICT facilities, including computer labs, internet access, multimedia equipment, and e-learning platforms. Data will be collected through surveys, interviews, and observational studies involving students, lecturers, and administrative staff.

Methods

This study employed a mixed-methods research design, combining both quantitative and qualitative approaches to comprehensively explore the impact of Information and Communication Technology (ICT) facilities on the quality of instruction in higher education institutions within Rivers State. The mixed-methods design was chosen to capture numerical data on ICT availability and usage, as well as to gain deeper insights into user experiences and challenges associated with ICT integration in teaching and learning.

The quantitative component involved a survey-based approach, while the qualitative component consisted of semi-structured interviews. This approach enabled triangulation of data to enhance the validity and reliability of the findings.

The target population for this study included academic staff and students from three major higher education institutions in Rivers State: Rivers State University, University of Port Harcourt, and Ignatius Ajuru University of Education. These institutions were selected due to their prominence in the region and their diverse student and faculty populations. A total population of approximately 5,000 students and 500 lecturers was estimated across the three institutions.

A stratified random sampling method was used to select respondents for the survey to ensure representation from various faculties and departments. For students,

stratification was based on year of study and faculty, while for lecturers, stratification was by department and academic rank. The final sample size consisted of 300 students and 60 lecturers, which was deemed adequate to provide statistically significant results while being manageable for data collection within the study timeframe.

Data collection for the quantitative part was conducted using a structured questionnaire developed based on relevant literature and the study's objectives. The questionnaire consisted of closed-ended questions covering aspects such as availability and adequacy of ICT facilities, frequency and manner of ICT usage in instructional delivery, perceived impact on teaching and learning, and challenges faced. The questionnaires were administered both electronically and in paper format to accommodate participants' preferences and accessibility.

For the qualitative component, semi-structured interviews were conducted with 10 academic administrators and ICT coordinators from the selected institutions. These interviews sought to explore in greater depth the institutional policies, support systems, and infrastructural factors influencing ICT integration, as well as perceived barriers and opportunities for improvement. Interviews were audio-recorded with the consent of participants and later transcribed verbatim for analysis.

The quantitative data were analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies, percentages, means, and standard deviations were computed to summarize the data. Inferential statistics, including correlation and regression analyses, were employed to examine relationships between ICT availability, utilization, and perceived instructional quality. The qualitative data were analyzed thematically using manual coding. Transcripts were carefully reviewed, and recurring themes and patterns were identified to complement and contextualize the quantitative findings.

Ethical considerations were strictly observed throughout the research process. Prior to data collection, ethical approval was obtained from the relevant institutional review boards of the participating universities. Participants were fully informed about the study's purpose, procedures, and their rights, including the right to withdraw at any time without penalty. Informed consent was obtained in writing from all participants. Confidentiality and anonymity were ensured by assigning unique codes to respondents and securely storing data. No personally identifiable information was collected or disclosed in reporting the findings.

By employing this systematic and rigorous methodology, the study ensured that the data collected were reliable, valid, and representative of the broader academic community in Rivers State. The mixed-methods approach enabled a well-rounded understanding of how ICT facilities influence instructional quality, capturing both measurable trends and nuanced perspectives.

Results

The data collected from the 360 respondents, comprising 300 students and 60 lecturers, alongside insights from 10 academic administrators, provide a comprehensive picture of the state of ICT facilities and their utilization in Rivers State higher education institutions. The results are presented according to key themes aligned with the research objectives: availability and adequacy of ICT facilities, usage

patterns among lecturers and students, perceived impact on instructional quality, and challenges faced in ICT integration.

Availability and Adequacy of ICT Facilities

Analysis of survey responses showed that the majority of both students (78%) and lecturers (85%) acknowledged the presence of basic ICT facilities such as computer labs, internet access, and multimedia projectors in their institutions. However, only 52% of students and 60% of lecturers rated the adequacy of these facilities as satisfactory or above. In particular, consistent internet connectivity was reported as available by 70% of lecturers but only 55% of students, suggesting some disparity in access. Additionally, advanced ICT tools such as virtual learning environments and e-library resources were reported as limited, with only 40% of lecturers and 35% of students indicating their regular availability.

Patterns of ICT Utilization

Regarding utilization, 65% of lecturers reported incorporating ICT tools regularly in their teaching practices, primarily using presentation software (PowerPoint) and internet-based resources. Only 30% of lecturers indicated frequent use of interactive technologies such as learning management systems or online assessment tools. Students' responses showed that 60% regularly used ICT facilities for research and accessing course materials, while 40% used them for communication with lecturers and peers. The data also indicated that lecturers with more than five years of teaching experience were less likely to integrate ICT extensively compared to their younger counterparts.

Impact on Instructional Quality

When asked about the impact of ICT on teaching and learning, 70% of lecturers agreed that ICT improved their instructional methods by making lessons more engaging and accessible. Similarly, 68% of students reported that ICT resources enhanced their understanding of course content and increased their motivation to learn. Notably, 55% of lecturers and 50% of students felt that ICT use had positively influenced academic performance and learning outcomes. However, a significant minority expressed neutral or uncertain views, suggesting variability in the perceived benefits.

Challenges and Barriers to ICT Integration

Both quantitative and qualitative data highlighted several challenges impeding effective ICT integration. A dominant issue was inadequate training, with 72% of lecturers indicating that they had not received sufficient professional development to maximize ICT use in their teaching. Power supply inconsistencies were cited by 65% of respondents as a major obstacle, leading to frequent disruptions during ICT-enabled lessons. Additionally, limited funding for upgrading ICT infrastructure and maintaining equipment was frequently mentioned by academic administrators during interviews. Students also noted issues of limited access to computer labs during peak times and occasional technical difficulties with institutional platforms.

Institutional Support and Policies

Interviews with academic administrators revealed varying degrees of institutional commitment to ICT integration.

While all institutions had ICT policies in place, only two of the three had dedicated units for ICT training and support. Administrators acknowledged the importance of ICT for educational quality but emphasized constraints related to budgetary allocations and infrastructure maintenance. There was a consensus on the need for continuous capacity-building programs and improved power and network infrastructure.

Summary of Quantitative Analysis

Statistical analysis using correlation tests showed a moderate positive correlation ($r = 0.56$, $p < 0.01$) between the availability of ICT facilities and their utilization by lecturers and students. Furthermore, regression analysis indicated that ICT utilization accounted for approximately 35% of the variance in perceived instructional quality ($R^2 = 0.35$, $p < 0.05$), suggesting a significant predictive relationship. However, the presence of barriers such as inadequate training and power issues was found to moderate this relationship negatively.

Discussion

The findings of this study reveal several important insights into the role of ICT facilities in enhancing the quality of instruction within Rivers State higher education institutions. The data underscore a generally positive relationship between the availability and utilization of ICT resources and improvements in teaching and learning processes. However, the extent of this impact is influenced by several contextual factors, including infrastructural limitations and capacity constraints. This discussion interprets these findings in light of the research questions posed and compares them with the broader literature on ICT integration in higher education.

Firstly, the study confirms that ICT facilities are increasingly present in Rivers State institutions, consistent with national and global trends toward digitalization in education. The majority of respondents acknowledged the availability of essential tools such as computer labs, internet access, and multimedia projectors. This aligns with previous studies that highlight increasing investments in ICT infrastructure by educational institutions as a response to the demands of a knowledge-driven economy. However, the reported inadequacy of some resources, especially advanced tools like virtual learning environments and e-library access, indicates that mere presence of ICT facilities is insufficient. This finding supports existing literature emphasizing the need for quality and quantity of ICT resources to go hand in hand to realize educational benefits fully.

Regarding utilization, the results show that while many lecturers incorporate ICT into their teaching, the use tends to focus on basic technologies like presentation software rather than more interactive or innovative tools. This suggests a gap between ICT availability and pedagogical integration, a common issue noted in similar contexts. The lower adoption of interactive learning platforms and online assessment tools could be attributed to limited training and confidence among educators, as highlighted by 72% of lecturers reporting inadequate professional development opportunities. This confirms the critical role of capacity building in ensuring that ICT tools translate into improved teaching methods rather than remaining underutilized equipment.

The study also found that younger lecturers tend to use ICT more extensively than their more experienced counterparts,

reflecting a generational divide in digital skills and openness to technology adoption. This supports literature suggesting that targeted training programs must consider demographic factors to be effective and that fostering a culture of continuous learning among all staff is essential for sustainable ICT integration.

Importantly, both lecturers and students recognized the positive influence of ICT on instructional quality and student engagement. The majority reported that ICT use made lessons more accessible and engaging, which contributed to improved understanding and motivation. This resonates with global findings that ICT can enhance learner-centered pedagogies, promote active learning, and facilitate access to diverse information sources. However, the presence of a significant minority who were neutral or uncertain about ICT benefits suggests that outcomes may vary depending on how technology is used and contextual factors such as student readiness and institutional support.

The challenges identified in this study provide crucial insights into why the full potential of ICT has yet to be realized in Rivers State. Inconsistent power supply emerged as a major barrier, a finding consistent with the infrastructural challenges commonly faced in many developing regions. Without reliable electricity, even well-equipped institutions struggle to maintain seamless ICT-enabled instruction. Moreover, funding constraints for infrastructure upgrades and maintenance compound these difficulties, as confirmed by administrators' reports.

The issue of limited access to facilities during peak times, as reported by students, highlights the need for strategic planning in ICT resource management. Institutions must consider not only procurement but also scheduling and maintenance to optimize the use of existing facilities.

The positive correlation found between ICT availability and utilization, as well as the significant predictive relationship between ICT use and perceived instructional quality, reinforce the conceptual understanding that technology can be a catalyst for educational improvement when properly integrated. However, the moderating effects of barriers such as inadequate training and infrastructural challenges caution against overreliance on hardware provision alone. This underscores the importance of holistic approaches that encompass technical, pedagogical, and administrative dimensions.

Institutional commitment and policy support were found to vary, affecting the degree of ICT integration. While all institutions had ICT policies, only some provided dedicated support for training and infrastructure maintenance. This unevenness reflects broader systemic issues in educational governance and resource allocation. The findings suggest that policy frameworks must be accompanied by actionable plans and sustained investment to be effective.

In summary, the study highlights that ICT facilities have a substantial role in enhancing instructional quality in Rivers State higher education but are not a panacea. Effective integration requires addressing multiple interrelated factors, including improving infrastructure reliability, enhancing capacity building for educators, ensuring equitable access for students, and fostering strong institutional support systems. These findings contribute to the growing body of evidence advocating for comprehensive strategies that go beyond technology provision to include human and organizational capacity development.

Conclusion

This study has demonstrated that the availability and utilization of ICT facilities in higher education institutions in Rivers State positively impact the quality of instruction. The presence of essential ICT tools such as computer labs, internet access, and multimedia equipment has contributed to more engaging and accessible teaching methods, which in turn enhance student learning experiences. However, the findings also reveal significant challenges, including inadequate training for lecturers, inconsistent power supply, and limited access to advanced technologies, which hinder the full realization of ICT's potential. The study underscores that while ICT infrastructure is crucial, effective integration depends equally on capacity building, reliable infrastructure, and institutional support. These insights highlight the need for comprehensive policies and targeted interventions that address both technological and human factors to improve instructional quality sustainably. Ultimately, enhancing ICT facilities and their utilization will position Rivers State's higher education institutions to better meet contemporary educational demands and contribute meaningfully to national development.

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