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# **Application Of ICT In Teaching And Learning In Polytechnics Of Rivers State**

<sup>1</sup>Ken. E. & <sup>2</sup>Chikweri I. N.

**Department of Computer Science,  
Captain Elechi Amadi Polytechnic, Rivers State Port Harcourt, Nigeria  
Corresponding email: [atataukechikennedy@gmail.com](mailto:atataukechikennedy@gmail.com)**

## **ABSTRACT**

The integration of Information and Communication Technology (ICT) in education has significantly transformed teaching and learning methodologies worldwide. In Nigerian polytechnics, particularly in Rivers State, ICT has the potential to enhance instructional delivery, improve student engagement, and facilitate access to vast educational resources. However, despite these benefits, ICT adoption in polytechnics remains low due to inadequate infrastructure, lack of trained personnel, and poor policy implementation. This study examines the extent of ICT utilization in teaching and learning within polytechnics in Rivers State. A survey research design was employed, with data collected from 160 respondents across two polytechnics. Findings reveal a severe shortage of ICT facilities, a lack of trained personnel, and constraints such as unreliable power supply and insufficient government funding. The study recommends increased investment in ICT infrastructure, regular training for lecturers, and policy reforms to promote ICT-driven education. Addressing these challenges will improve the quality of education in polytechnics and prepare students for the digital economy.

**Keywords:** ICT, polytechnics, teaching, learning, digital education, Rivers State

## **1. INTRODUCTION**

The integration of Information and Communication Technology (ICT) in education has transformed teaching and learning worldwide, providing innovative tools to enhance instructional delivery and improve student engagement. ICT enables educators to create interactive and engaging learning environments, allowing students to access vast digital resources and develop critical thinking skills. As global educational systems continue to embrace technology-driven instruction, developing nations like Nigeria must also integrate ICT into their teaching methodologies to improve learning outcomes and prepare students for the digital economy. However, the application of ICT in Nigerian polytechnics, particularly in Rivers State, remains inadequate due to infrastructural deficiencies, lack of trained personnel, and poor policy implementation.

Teaching and learning in polytechnics involve a combination of theoretical instruction and practical application, making ICT an essential tool for improving efficiency and knowledge acquisition. According to Attama (2001), ICT facilitates active learning by transforming students from passive recipients of information into engaged participants in their educational journey. Through digital learning platforms, multimedia teaching aids, and virtual simulations, ICT enhances comprehension and retention of complex concepts. Despite these advantages, many polytechnics in Rivers State lack the necessary ICT facilities, such as well-equipped computer laboratories, internet connectivity, and multimedia instructional tools.

Additionally, many lecturers have not received adequate training in ICT-based teaching methods, limiting their ability to integrate digital resources into their instructional processes effectively.

Given these challenges, this study seeks to assess the extent to which ICT is applied in teaching and learning within Rivers State polytechnics. The specific objectives of the study are to:

1. Identify the availability of ICT facilities in polytechnics for educational purposes.
2. Evaluate the level of trained personnel capable of utilizing ICT in teaching and learning.
3. Examine the challenges limiting the effective application of ICT in polytechnics.
4. Propose strategies for improving ICT integration in polytechnic education.

To achieve these objectives, the study aims to answer the following research questions:

1. What ICT facilities are available for use in polytechnics in Rivers State?
2. To what extent are trained personnel available to operate ICT facilities for teaching and learning?
3. What are the key constraints limiting the application of ICT in polytechnics?

By addressing these questions, this research will provide insights into the current state of ICT adoption in polytechnics and offer practical recommendations for improving digital education in Rivers State. A well-integrated ICT system in polytechnics will not only enhance teaching and learning but also equip students with the digital skills required to compete in today's technology-driven world.

## 2. METHODOLOGY

This study adopted a survey research design to assess the application of ICT in teaching and learning within polytechnics in Rivers State. A survey approach was chosen because it allows for the collection of data from a defined population to understand trends, opinions, and challenges related to ICT integration in education. The research was conducted in two polytechnics in Rivers State, Nigeria: Captain Elechi Amadi Polytechnic, Port Harcourt, and Ken Saro-Wiwa Polytechnic, Bori. These institutions were selected because they represent key technical and vocational education providers in the state.

The study population consisted of 160 respondents, including 120 lecturers and 40 technologists/technicians from the two polytechnics. Due to the relatively small population size, the study adopted a census sampling technique, meaning all 160 respondents participated in the study, eliminating the need for random sampling.

A structured questionnaire was designed to gather data on ICT availability, personnel competence, and challenges in its application. The questionnaire consisted of three sections: availability of ICT facilities, competency levels of lecturers and technical staff in operating ICT tools, and challenges affecting ICT adoption in polytechnics. A 4-point Likert scale was used, where respondents indicated their level of agreement with each item: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

To ensure validity, the questionnaire was reviewed and face-validated by three experts in educational technology and ICT applications in higher education. Reliability was tested using the Cronbach Alpha correlation method, which yielded a reliability coefficient of 0.84, indicating a high level of internal consistency.

Data collected from the questionnaires were analyzed using descriptive statistics, specifically weighted mean and standard deviation. The decision rule for interpreting the mean scores was as follows: Mean values of 2.50 and above indicated agreement with the statement, while mean values below 2.50 indicated disagreement.

## 3. RESULTS

The results of this study were analyzed based on the research questions, using weighted mean and standard deviation to determine the level of agreement among respondents. The findings are presented in tables and explained accordingly.

The first research question sought to determine the availability of ICT facilities in polytechnics in Rivers State. The results indicated that essential ICT facilities such as microteaching laboratories, internet services, power points, computers, and overhead projectors were largely unavailable. The mean values for these items ranged from 1.38 to 1.88, all below the decision threshold of 2.50, indicating strong disagreement among respondents regarding the availability of these facilities.

The second research question examined the availability of trained personnel to handle ICT facilities in polytechnics. The results revealed that while technologists and technicians were generally competent in operating ICT equipment, their numbers were insufficient to meet institutional needs. The study found that professors and PhD holders were less competent in using ICT tools for instructional purposes, with a mean score of 1.88. However, respondents agreed that technicians and technologists had the required skills, as indicated by mean scores of 2.50 and 3.25, respectively.

The third research question explored the constraints affecting the application of ICT in teaching and learning. The study identified several major challenges, including inadequate ICT devices, limited knowledge among lecturers, poor funding, and unreliable power supply. The mean scores for these constraints ranged from 2.88 to 3.88, indicating strong agreement among respondents. The issue of inadequate ICT devices was particularly prominent, with a mean score of 3.88, reflecting widespread concern over the lack of essential technological resources. Additionally, respondents agreed that many lecturers lacked sufficient training in ICT, as evidenced by a mean score of 2.88. Unstable power supply was another critical challenge, with a mean score of 3.63, confirming that electricity issues continue to hamper ICT adoption in polytechnics.

#### **4. DISCUSSION**

The results of this study confirm that ICT adoption in polytechnics in Rivers State remains significantly low due to infrastructural deficiencies, inadequate trained personnel, and systemic challenges such as poor funding and unstable electricity supply. These findings align with previous research, highlighting key barriers to effective ICT implementation in Nigerian educational institutions.

The lack of ICT facilities, as revealed in the study, is consistent with findings by Eze (2001), who emphasized that the availability of instructional resources significantly impacts the success of teaching and learning. Similarly, Attama (2001) noted that ICT facilitates active learning by transitioning students from passive recipients of information to engaged participants in their education. The absence of well-equipped microteaching laboratories, internet access, and multimedia instructional tools suggests that students and lecturers have limited opportunities to engage with digital learning platforms, thereby affecting the overall quality of education.

The study further found that while some trained personnel exist, their numbers are insufficient to meet the growing ICT needs of polytechnics. The findings support Ene (2001), who noted that ICT enhances communication and learning efficiency but requires trained educators to maximize its potential. The mean scores indicated that while technicians and technologists demonstrated competency in ICT operations, lecturers, particularly those with higher academic qualifications, were less proficient in digital teaching tools. This suggests a need for targeted ICT training programs for lecturers to enhance their instructional methods. The constraints identified in this study, including poor funding, unstable electricity supply, and inadequate ICT devices, align with previous research by Mbam (2002), who described ICT as a critical tool for educational advancement yet noted that its implementation in Nigerian institutions remains hindered by financial and infrastructural challenges. The agreement among respondents on these issues indicates a pressing need for government intervention, increased funding, and strategic investments in digital education. Overall, the findings highlight the urgent need for improved ICT infrastructure, increased training for lecturers, and policy reforms to support digital education in polytechnics. Without adequate investment in ICT facilities and human resources, polytechnics in Rivers State will struggle to provide students with the digital skills necessary to compete in today's technology-driven world.

#### **5. CONCLUSION AND RECOMMENDATIONS**

The integration of Information and Communication Technology (ICT) in teaching and learning has become essential for enhancing educational outcomes in polytechnics. This study assessed the extent of ICT adoption in polytechnics in Rivers State, identifying key challenges such as inadequate ICT facilities, lack of trained personnel, poor funding, and unstable power supply. The findings revealed that while some technical staff possess the required ICT skills, there is a shortage of trained lecturers capable of integrating digital tools into instructional delivery. Additionally, the limited availability of essential ICT facilities has hindered effective learning, preventing students from accessing modern digital resources.

Based on these findings, the following recommendations are proposed to improve ICT adoption in polytechnic education:

1. **Provision of ICT Infrastructure:** The government and institutional management should prioritize the provision of well-equipped computer laboratories, internet access, multimedia teaching tools, and other ICT-related facilities to enhance digital learning.
2. **Capacity Building and Training Programs:** Regular training and professional development workshops should be organized for lecturers and technical staff to improve their competency in utilizing ICT for teaching and learning.
3. **Increased Government Funding:** Adequate budgetary allocations should be made to support ICT implementation in polytechnics, ensuring that institutions can acquire and maintain essential digital resources.
4. **Improved Power Supply:** Efforts should be made to provide alternative power sources, such as solar energy or backup generators, to ensure the uninterrupted use of ICT facilities.
5. **Policy Implementation and Support:** The government should establish clear policies that mandate the integration of ICT into the curriculum while ensuring strict implementation at the institutional level.
6. **Encouraging Public-Private Partnerships:** Collaborations with private sector organizations and technology firms should be encouraged to provide funding, ICT infrastructure, and technical expertise to polytechnics.

By addressing these challenges, polytechnics in Rivers State can create an ICT-driven learning environment that prepares students with the necessary digital skills for the modern workforce. A sustained commitment to improving ICT adoption will enhance the quality of education, making polytechnic graduates more competitive in the evolving digital economy.

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