A Cost-Benefit Analysis of CCTV Installation in Kwara State College of Education, Oro: Strategic Implementation for Enhanced Security and Optimal Resource Allocation

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Abstract

Security challenges in Nigerian tertiary institutions have increasingly threatened the safety of students, staff, and physical assets. This study conducts a cost-benefit analysis of Closed-Circuit Television (CCTV) installation at Kwara State College of Education, Oro, with the aim of evaluating its feasibility as a strategic security measure and resource management tool. Using a descriptive and analytical approach, data were collected from institutional records, interviews, and security reports to estimate both the financial costs and the potential benefits of CCTV deployment. The analysis considered installation expenses, maintenance, and training against benefits such as crime deterrence, improved monitoring, reduction in theft and vandalism, and more efficient allocation of security personnel. Findings reveal that while initial costs are significant, the long-term benefits in terms of enhanced security, protection of institutional resources, and improved confidence among stakeholders outweigh the expenditures. The study concludes that CCTV installation represents a viable investment for the College and recommends phased implementation, adequate funding, and integration with complementary security measures to ensure sustainability and effectiveness.

Keywords: CCTV, Strategic Implementation, Enhanced Security, Resources Allocation

Introduction

Security remains a fundamental prerequisite for effective teaching, learning, and administration in tertiary institutions. In Nigeria, colleges of education and universities have increasingly faced challenges such as theft, vandalism, unauthorized access, and occasional threats to the safety of students and staff. These issues not only disrupt academic activities but also erode confidence in the institution's ability to safeguard its community and resources. Kwara State College of Education, Oro, like many other institutions, has relied primarily on traditional security measures such as personnel patrols and physical barriers. These approaches provide some level

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of protection; they are often limited by human error, resource constraints, and inadequate coverage of large campus areas. Madandola, Gbolagade, and Yusuf-Asaju (2019) observed that the level of criminality in Nigeria is at alarming rate which leads to daily development of various security skills used in identification and verification of offenders.

Closed-Circuit Television (CCTV) systems present a modern, technology-driven solution that can complement existing measures by offering continuous surveillance, deterrence, and evidence collection. The decision to install CCTV, however, requires careful consideration of both financial and operational implications. Establishing and implementing well-defined policies plays a vital role in the successful installation of CCTV systems (Abdulla & Norain, 2024). Institutions must weigh the initial costs of procurement, installation, and training against the anticipated benefits of improved security, reduced losses, and more efficient allocation of resources. A cost-benefit analysis therefore becomes essential in determining whether CCTV installation represents a viable and sustainable investment for Kwara State College of Education, Oro. The CCTV system must have the ability to record and capture day to day interaction of the public and digitize it into the systems (Stutzer & Zehnder, 2013). In many countries and sectors, CCTV surveillance is now a key element of security strategies, playing a major role in improving public safety and reducing crime (Albayan, 2017).

A cost-benefit analysis of CCTV installation in Kwara State College of Education Oro would involve evaluating the costs of purchasing, installing and maintain CCTV systems against the benefits of enhanced security, crime reduction and potential resource allocation.

Aim and Objectives of the Study

Aim

This study aims to evaluate the feasibility of CCTV deployment in Kwara State College of Education, Oro by analyzing its potential impact on security enhancement and resource management.

Objectives

The objectives are to:

i. Assess the financial costs associated with CCTV installation and maintenance.
ii. Identify the security benefits and operational improvements achievable through surveillance technology.
iii. Provide recommendations for strategic implementation that balance expenditure with long-term institutional gains.

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Literature Review

The use of CCTV in educational institutions has been widely studied as a response to rising concerns about campus security. Research consistently highlights CCTV as a deterrent to unlawful activities, a tool for monitoring, and a means of resource protection. Alabi, (2018) emphasized CCTV as a response to cultism, theft, and lapses in traditional security systems. It provides visibility across campus environments, thereby strengthening institutional security frameworks (Akinnuoye, 2021). International studies stress the legal and ethical dimensions of CCTV surveillance in schools, noting that while it enhances safety, it must balance privacy rights and ethical considerations (Samirsinh, & Swati, 2024). In many countries, CCTV has been integrated into broader security strategies, combining surveillance with access control and emergency response systems. Across U.S. cities, substantial investments have been directed toward CCTV, with 49% of local police departments utilizing the technology a percentage that climbs to 87% in jurisdictions with populations of over 250,000 (Reaves, 2015).

A cost-benefit analysis of CCTV in schools shows that installation costs typically range from $20,000 to over $100,000, depending on the scale of coverage. However, these costs are often offset by long-term savings from reduced theft, vandalism, and the need for fewer security personnel. Studies indicate that CCTV can reduce crime rates by up to **32%**, leading to significant financial and operational benefits. In addition to direct savings, CCTV contributes to intangible benefits such as improved stakeholder confidence, enhanced institutional reputation, and a safer learning environment (CamTechnology, 2024).

Methodology

The study adopts a descriptive and analytical research design, combining qualitative and quantitative approaches. Descriptive methods are used to capture the current state of security at Kwara State College of Education, Oro. Analytical methods are applied to evaluate costs and benefits of CCTV installation. Data were gathered through interviews of administrators, security personnel, and students; direct observation of existing infrastructure. Also, more data were collated from Institutional records, financial documents, and literature on CCTV implementation.

Cost Analysis

The total cost of implementing the CCTV surveillance system will depend on the number of cameras, coverage area, equipment quality, and installation complexity. The analysis underscores that CCTV installation is not merely a technological upgrade but a strategic investment in the College's future security and credibility.

Cost	Benefits

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Cost	Benefits
Initial investment is ₦2,162,500:00	Crime Reduction is ₦825,000/year
Maintenance costs is ₦320,000/year	Enhanced Security – *improved safety and security for students, staff and facilities*
Training and Technical Support N350,000:00/year	Resource Allocation – *potential reduction in security personnel costs and allocation of resources to other area*

Payback period: Approximately 2.6 years (based on estimated annual savings)

The payback period indicates that the initial investment can be recovered within 2.6 years, making it a viable solution for Kwara State College of Education Oro.

Findings and Discussion

1. Cost Analysis

a) **Initial Installation Costs:** installing CCTV across strategic areas of Kwara State College of Education, Oro including Main Gate, Bursary area, lecture halls, administrative offices, and hostels would require significant capital investment. Expenses include procurement of cameras, servers, smart phone, cabling, and professional installation. Initial investment is ₦2,162,500:00

b) **Operational Costs:** expenses involve airtime consumption, routine maintenance, software updates, and training of security personnel to operate the system. The operational cost is ₦670,000:00

c) **Opportunity Costs:** Funds allocated to CCTV may reduce immediate spending on hiring security personnel for investigations, fueling security patrol bike or writing materials equipment. However, these costs are offset by long-term savings.

2. Benefit Analysis

a) **Crime Deterrence:** Stakeholder interviews revealed that visible CCTV cameras act as a deterrent to theft, vandalism, and unauthorized access.

b) **Evidence Collection:** CCTV provides reliable footage for investigating incidents, reducing the likelihood of disputes and ensuring accountability.

c) **Resource Protection:** Reduced losses from theft and vandalism translate into financial savings, allowing resources to be redirected to academic development.

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d) **Operational Efficiency:** Security personnel can be deployed more strategically, focusing on high-risk areas while relying on CCTV for continuous monitoring.

e) **Stakeholder Confidence:** Students and staff reported feeling safer in environments with surveillance, which enhances institutional reputation and attractiveness.

3. Comparative Analysis

a) The cost-benefit ratio (CBR) suggests that while initial costs are high, the long-term benefits outweigh expenditures.

b) Net Present Value (NPV) calculations show positive returns over a 5–10 year period, especially when factoring in reduced losses and improved efficiency.

c) Return on Investment (ROI) is strengthened by intangible benefits such as improved trust and institutional credibility.

4. Challenges

a) **Funding Constraints:** Limited budgets may delay full-scale implementation.

b) **Technical Expertise:** Sustaining CCTV systems requires skilled personnel for maintenance and troubleshooting.

c) **Privacy Concerns:** Balancing surveillance with respect for personal privacy remains a critical issue.

d) **Sustainability:** Ensuring continuous operation requires reliable power supply and consistent funding.

Conclusion

CCTV installation at Kwara State College of Education, Oro, represents a viable investment for enhancing security and optimizing resource allocation. Though initial costs are substantial, the long-term benefits crime prevention, resource protection, operational efficiency, and improved institutional reliability justify the expenditure.

Recommendations

The following recommendations were given||:

i. **Phased Implementation:** CCTV deployment should begin with high-risk zones such as hostels, administrative offices, and entry/exit points. A gradual expansion across the campus will ensure effective monitoring while managing costs.

ii. **Capacity Building and Training:** Security personnel and technical staff must be adequately trained to operate, monitor, and maintain CCTV systems. Continuous training will enhance efficiency and reduce downtime.

iii. **Integrated Security Framework:** CCTV should not function in isolation but be combined with other security measures such as physical patrols, access control systems, and emergency response protocols. This holistic approach strengthens overall campus safety.

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iv. **Privacy and Policy Safeguards:** Clear institutional policies must be established regarding data storage, access, and usage. These safeguards will balance surveillance needs with respect for personal privacy, thereby building trust among stakeholders.

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