

# Closed Circuit Television Cameras (CCTV) and Curtailing Unlawful Actions in Kwara State College of Education Oro, Nigeria.

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## Abstract

This study sought to establish the importance of Closed-Circuit Television Cameras (CCTV) in curtailing unlawful actions in the Kwara State College of Education Oro. Several offenders and vandalizers have gone unapprehended for a very long time since the establishment of this institution and has accumulated a depreciating value for the college. This study which entails the installation of CCTV cameras, surveillance and Observation recording has attempted to resolve this menace also, preferring solutions to other preexisting challenges.

Although this research was narrowed to the limits of the funds available, it is evident that CCTV is an efficient investigative device for all kinds of crime and a means of curtailing unlawful actions in higher institutions.

**Index Terms:** Closed-Circuit Television Cameras, Higher Institution, Malpractice, Unlawful

## I. INTRODUCTION:

Closed Circuit Television cameras (CCTV) is used broadly in a various institutions and businesses in both the public and private sectors; this includes secondary and tertiary institutions. In such environments, CCTV is used for safety and security purposes such as:

- To protect staff or students from violence or other criminal occurrences;
- To provide evidence for suspicious incidents;
- To safeguard property from vandalism;
- To prevent unacceptable behaviour within the premises
- To deter truancy.

This research focused on how the use of CCTV will be effective in enhancing the management and also the reduction or total eradication of unlawful activities in Kwara State College of Education, Oro. There are several unlawful activities that are pertinent to tertiary institutions of which this institution is not an exception from the others; These criminal actions can be monitored hence curtailed by the proper installation of CCTV cameras in the appropriate places in the college. Some of these activities include Examination Malpractice, infiltration of Cultists, Classrooms rowdiness/uproar, molestation/abuse of fellow students, unlawful gathering on the campus and theft. Furthermore;

1. It acts as a restriction to anybody with mal-intent.

2. It enhances the security personnel since it is inanimate and thus never tires.
3. It helps in monitoring and recording of activities happening in school premises.
4. It helps to record the identity of trespassers or offenders.
5. It helps to keep valuables under surveillance.
6. It helps prevent vandalism or theft in the covered area.
7. It can be used to record the attendance of students and staff, ensuring that they are all doing their duties efficiently.
8. It aids in keeping a watch on the lecturers' methods of teaching and punctuality.

This research will examine the impact of CCTV in attempting to solve these problems; this will necessitate the installation of CCTV cameras in some strategic areas of the college functioning round the clock. Progressively and at the end of the research, it will be examined if there has been an improvement in apprehension of offenders and thus proper composure of students in and outside the classrooms.

## **II. LITERATURE REVIEW**

Closed Circuit Television (CCTV) plays a vital role in protecting the public and assisting the law enforcement agencies in the investigation of crime and apprehending of offenders. "The UK is one of the most watched countries in the world" (McCahill and Norris, 2003; Phillips, 1999). It is estimated that there are about five million CCTV cameras in use today, and this number is likely to increase significantly in the future (Gill, 2006). Even though the exact number of CCTV systems installed in the UK is unclear, "the extent of CCTV coverage and the government's funding of new systems have increased dramatically over the last decade," (Armitage, 2002, p 6) yet there is little substantive research evidence to show that CCTV works (Armitage, 2002). The research presented examines the social and technical problems affecting CCTV performance, provides a framework for understanding the causes of problems, and guidance on how to overcome them in practice. A CCTV security system is typically configured to record CCTV video footage of people (targets) and their activities.

In Britain today, it is impossible to avoid the vast amount of surveillance that covers the country. Over the last 20 years, the dramatic increase in Closed Circuit Television cameras (CCTV) and other forms of surveillance has meant that getting caught on camera is part of everyday life. The exceptional growth of CCTV in Britain has caused it to be often described as a 'Surveillance Society' where it is a norm to be watched when shopping in a supermarket or travelling on public transport. There are also debates discussing the different aims of CCTV and the impacts and effectiveness CCTV has on society. Therefore, there have also been many theories and literature on surveillance introduced in the last decade in criminology; much of which looks at CCTV as a crime prevention measure.

Before looking at the most recent theories on surveillance, it is useful to look at some traditional theorists and how their work relates to surveillance. Both Marx and Weber's theories give reasons why they believe surveillance exists in the social world.

"Karl Marx focuses special attention on surveillance as an aspect of the struggle between labour and capital. Overseeing and monitoring workers is viewed here as a means of maintaining managerial control on behalf of capital" (Lyon, 1994: 7).

This shows Marx's view that in a capitalist society, workers in factories, for example, were watched for the factory owners to remain in control and continue to make money.

"Max Weber, on the other hand, concentrates on the ways that all modern organizations develop means of storing and retrieving data in the form of files as part of the quest of efficient practice within a bureaucracy. Such files frequently contain personal information so that organizations, especially government administrators can 'keep tabs' on populations" (Lyon, 1994:7).

These past theories and conceptions are relevant as they give us some history and background information. We can see from these arguments that surveillance has always existed as social control. We can also see how theories expand and develop as surveillance does. I can now move on to look at how surveillance and CCTV is perceived in contemporary society and how it has affected it. CCTV has dramatically risen in Britain and therefore has different areas of research surrounding this. For example, fear of crime, risk society, public safety and crime prevention.

### **CCTV as a crime prevention method**

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Their main aim of the increase of CCTV in the UK was to reduce crime and use it as an effective crime prevention method. Therefore in 1995: “the government announced the establishment of a special fund, known as the ‘CCTV Challenge Competition’, to encourage local authorities to set up and part fund surveillance schemes” and “in the three years to the end of 1997 the Home Office and local authorities collectively invested £120 million in CCTV systems” (Guardian 9.1.1998 cited in Crawford, 1998: 41).

These CCTV systems were put in place as a way of detecting and deterring crime, monitoring scenes and to cause self-discipline. They also suggest that CCTV "may prevent crime because potential offenders are deterred by their increased subjective probability of being detected" (Welsh & Farrington, 2009: 36). This is sometimes referred to as situational crime prevention and shows that the presence of CCTV could cause potential offenders not to commit a crime as the risk outweighs the benefits. Therefore, CCTV reduces offenders' opportunities to commit crimes. It also links to the idea that CCTV is used to produce self-discipline in victims and offenders. For potential victims CCTV is a “reminder of the ‘risk’ of crime, therefore altering their behaviour accordingly” (Armitage, 2002: 1) and controlling their safety.

### Definitions

- **CCTV system:** A system comprising of electronic or other devices designed or modified to record images and a particular designated area.
- **CCTV installation:** The installation of the hardware and software parts of a CCTV system, fully installed and functioning for surveillance in a designated area.
- **CCTV camera:** A unit containing an imaging device (cameras) producing a video signal from an optical image.
- **Camera Housing:** A casing or covering to provide physical or environmental protection for the camera, lens and additional equipment.
- **Data:** images, Meta and other types of data in the CCTV system.
- **Documentation:** paperwork or media prepared during the design, installation and hand over of the CCTV system, showing details of the CCTV system.
- **Export:** transfer of data from the location where the cameras are installed to a secondary storage location with minimum changes.
- **Frame rate:** numbers of frames recorded per second.
- **Illumination:** level of light coming into the area to be kept under surveillance.
- **Image:** visible illustration of a frame as a rectangular grid of pixels.
- **Interconnections:** means by which signals and/or messages are transmitted between CCTV system components.
- **Notification:** sending an alarm or a message of the CCTV system to an external system.
- **Operator:** authorized person using a CCTV system for its planned purpose.
- **Response:** These are every form of signals on every control command, change of system conditions or information to external devices or persons.
- **Surveillance:** observation of persons and premises for security purposes through alarm systems, CCTV systems, or other monitoring methods.

### BENEFITS OF CCTV INSTALLATION

Closed Circuit Television Cameras are used in various circumstances to provide video surveillance. It is a useful tool for variety of reasons such as;

- ✓ **Preventing crimes:** It helps you identify how a crime happened and to spot it in action for example, the case of cheating in Examination halls.
  - ✓ **Protecting Employees:** It protects them against false allegations which are very common depending on the type of the business.
  - ✓ **Keeping records:** It serves as an automated system for keeping records .
  - ✓ **Inspiring confidence:** It is also useful to the customers themselves by creating a safe feeling environment.
  - ✓ **Settling disputes:** it helps to know who is wrong when a customer complains about your services.
- The benefits are numerous; however, it also aids the police and other security agencies in curbing situational crimes.

## **Data and Methods:**

This research surrounds the effectiveness of CCTV in curtailing unlawful activities in the institution. During the course of this research CCTV cameras will be installed in some strategic locations of the campuses and activities will be monitored remotely from the Security unit and Provost's offices. There will also be provision for downloading of the software on the mobile phones of some selected individual as will be determined by the College management. This process will involve the purchase and installation of the CCTV and training of the officials that will be the handlers.

### **Description of the Study area**

For the purpose of this research, the areas to be put under surveillance is the entire College, however, it will be in phases. The classrooms, the Main gate, old Library area, ICT and Central administrative building will form Phase 1.

### **Location Survey**

The criteria above were determined by a location survey of the site where the CCTV system was to be installed. The location survey takes account of the following:

- a) Risks
- b) Contents
- c) Infrastructures
- d) Supervision levels

The location survey shall have, at least, necessary details to satisfy the security requirements of the client or user and shall lead to a site plan being prepared with the optimum positioning places for cameras which will be shown on the site plan. The aim for the location survey and site plan is to identify the best positioning for CCTV cameras, the illumination, potential and actual environmental problems. It is essential to ensure that the camera is not blocked by trees, infrastructures or shaded from light.

### **System Design**

The system design stage aims to determine the limits of the CCTV system, select the appropriate components and prepare a system design proposal. The system design also depends on the client's requirements as to the purpose of the camera images.

The following are recommended specifications for the screen resolution in for different installation purposes.

- a. For identification purpose alone, the target shall represent not less than 120% of screen height.
- b. For recognition of images, the target shall represent not less than 50% of screen height.
- c. For detection of movement, the target shall represent not less than 10% of the picture height.
- d. For monitoring (e.g. crowd regulation) the target shall represent not less than 5% of the picture height

When designing a system, a risk assessment is conducted to ensure that the system is paying attention to the function or surveillance described by the client. The event of the observation or surveillance can include: crowd control, theft and unauthorized entry and so on.

When installing a CCTV surveillance, the following criteria is taken into consideration under the headings Operational Requirements:

### **Operational Requirement**

- a) Purpose(s) of the surveillance.
- b) Potential threat and activities to be monitored and recorded.
- c) Determination of the number of cameras, and the locations required to be monitored and the agreed areas and objects.
- d) Determination of the areas or objects requiring surveillance.
- e) Proposed target(s) of the surveillance and the frame rate appropriate to the target's speed within the location under surveillance.
- f) Response required on detection of an event e.g. alarm, text message etc.
- g) Manner in which images will appear.
- h) How data will be transferred from the system to a secondary storage.
- i) Individuals (operators) who will require access to the recorded data.
- j) Selection of cameras and equipment with regard to the environmental conditions of the selected location.
- k) Control center configuration that includes secure location of control equipment.

- l) Power supplies; the use of a UPS System should be considered in situations where there is no permanent supply of electricity.
- m) Functional and operating procedures.
- n) Maintenance and repair.
- o) Assessment of existing lighting and consideration of new or additional illumination including the use of Infra-Red cameras.
- p) Image resolution required by client.
- q) Determination of the best transmission method to be used.

### Installation Planning

Prior to the installation of the components of the CCTV system, the following issues shall be put into consideration.

**Manufacturer’s recommendations-** All system components shall be installed according to the manufacturer’s recommendations.

**Environmental considerations:** System components shall be appropriate for the environmental conditions of the location in which they are to be installed. Examples of environmental considerations include potential differentiation in vegetation of different seasons, potential effect of daily and seasonal differences in light and climatic conditions.

### CCTV Installation

**Competence-** The installation shall be carried out by technicians with the required trainings and experiences. Installers shall have the suitable tools and test equipment necessary to install the CCTV system correctly. Prior to installation, all health and safety requirements shall be put into consideration. These will vary with the conditions of the location and may involve special installation equipment when working in dangerous areas.

Electrical installation methods shall comply with all regulations in place and the electrical installation shall be carried out by technicians who are qualified for the task.

**Test and Commission:** The equipment shall be tested properly to ensure that the system is working perfectly before commission.

**Inspection:** An inspection shall be carried out and documented on conclusion of the installation of the CCTV systems to confirm that the CCTV system has been installed according to the System Design Proposal.

**Functional Testing-** The CCTV system shall be tested and compared with the requirements the System Design Proposal contains.

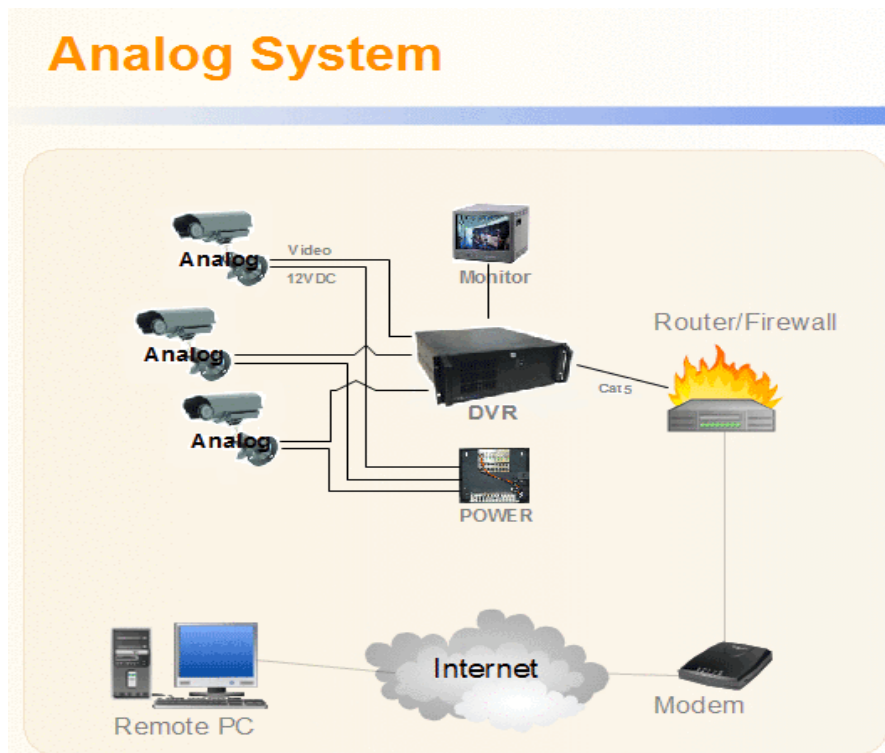


Figure 1: Analog System of CCTV

A document is prepared, based upon the System Design Proposal, modified to show any changes to the CCTV design found to be crucial during the installation stage. The “As Fitted Document” is an accurate record of the installed CCTV system including any information relating to the equipment installed and the location.

**Maintenance**

Regular preventative maintenance should be carried out to ensure that the CCTV system performs at an optimal level all round. Trained professionals will conduct Maintenance, servicing and repair of CCTV systems.

Arrangements for the CCTV system to be appropriately maintained (examined and serviced) and repaired as scheduled. Since this TETFUND sponsored project cannot cover the entire College area, a documented arrangement will be made between the College and a licensed company for the provision of CCTV camera and other gadgets to extend coverage and also for the repair and maintenance of the system. The schedule of maintenance shall be specified including:

- the frequency of maintenance needed,
- whether the maintenance is conducted remotely or on-site, and
- the requirements for the maintenance

**Training for School Security officers**

Training programs will be organized for the security personnel and other concerned members on how to operate and manage the CCTV systems newly installed. These training will come in different forms such as Seminars, practical and so on. Apart from the primary purposes of this research which is to determine the effectiveness of the use of CCTV in curtailing unlawful acts, it will also serve as a means for advancement in the knowledge of Computers and Technology for the member of staff which is a crucial tool for development in this 21<sup>st</sup> century.

**Table I: Equipment Description**

S/N	EQUIPMENT DESCRIPTION	QUANTITY
1	OUTDOOR IP CAMERA; HD, 4Mega Pixel 1080color pixel, Lens: 3.6mm, High-Performance Digital Signal Processor (DSP)	10
2	AHD OUTDOOR IP CAMERA: 2Mega pixel, Lens: 3.6mm; 1080color pixel, High-Performance Digital Signal Processor (DSP)	10
3	Point to Point radio: Frequency 5GHZ; Product TP-Link; Transmit range: Long haul	2 pairs
4	12V Dedicated camera power supply: 4 channels	1
5	LAN Cable: Cat 6, Pure Copper	1 carton
6	Coaxial Cable, Pure Copper with power	1 carton
7	Hybrid Network Recorder (HNR): 8 channels	2
8	Hard Disk Drive: 1TB	1
9	BNC Connector	10
10	DNC Connector	10
11	High Definition Multimedia Interface (HDMI) splitter: 1080pixel; 2channels	1
12	HDMI cable: 3meters	1
13	HDMI cable: 10meters	1
14	HDMI cable: 20meters	1
15	High Definition video balloon	2 pairs
16	Installation materials: RJ 45 connector, Electrical wire, Trucking pipe, Nails, Screw, Tape, Pattress and phase plate, Sockets, Electrical extension box.	Lots

**Results:**



This Research is formulated to investigate how the digital CCTV in conjunction with human operators within an academic institution will help to solve various security challenges being faced, a case study of Kwara State College of Education Oro. This research also intends to identify the underlying factors which boost or reduce the effectiveness of CCTV technology concerning technical failures of CCTV when used for security observation tasks performed by human operators and then examine how this will impact the Educational development and the effect on curtailing the unlawful acts in the institution. The findings of this research will also give birth to other technological research such as Face Identification, attendance management and their usefulness in the Academic environment.

## Observations

- The installation of the CCTV cameras was a success
- The operators in charge of the HDR, Screens and other devices controlling the CCTV ( i.e. College HSO and other security men in the surveillance department) found them easy to handle after the training received.
- The Chief Security Officer of the College, i.e. the Provost's office is linked to the control centre, thereby affording him, from time to time, independent surveillance of his office premises and on the spot activities around the Campus.
- The cameras, some of which are not consciously noticed, are strategically positioned to capture the students' and visitors' activities in different strategic areas of the college and the daily displays and recordings show that it has helped security surveillance and checked student to be more cautious knowing fully well their actions are being monitored somewhere they don't know.
- There has been no case of attempted vandalism of the CCTV cameras which was the initial fear or rather predicted to occur by the security department.
- The CCTV has aided the Institution to observe some activities of the student that was hitherto not noticed or could not be captured by the few surveillance officers when these cameras were not present.
- The CCTV cameras positioned at the entrance and exit of the College campus is of striking importance because the security unit has been able to monitor hawkers, the individuals or group of people entering and leaving the campus.

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