

Evaluating the Role of Electronic Security Surveillance in Enhancing Safety in Secondary Schools: A Case Study of Trans Nzoia County, Kenya

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ABSTRACT

Secondary school safety is critical to sustaining comparable academic performance outcomes. However, there are so many threats that affect the safety of schools that make up this necessity throughout the world. Security challenges in secondary schools in Kenya includes fires, theft and radicalization have been witnessed in school. Nevertheless, the application of electronic security surveillance systems still remains rather low. They work under very high risks and many schools in Trans Nzoia County are especially vulnerable leaving the school community at risk. This research aimed at evaluating the extent to which these systems enhance safety. Based on Situational Crime Prevention Theory and Contingency Theory, the study adopted descriptive survey research design and targeted 14 second schools with previous security threats and deployed with surveillance systems. Participants were 14 principals, 14 boarding teachers, 14 security personnel, 70 students- 10 students from each of the 7 schools, County Director of Education, and the Chief Fire Officer. The sample size for the study was 128 respondents. Data was collected using questionnaires, interview schedules and Focus Group Discussions. The data was analysed through using Social Package for Social Sciences version 25. Regarding electronic surveillance system improvement of school security, 80.8 percent of respondents supported its effectiveness. When national ICT and school safety policies had been included, it was found that the improvement of these systems for the safety of schools has proved 40.9% different ($R^2 = 0.409$, $F(2, 75) = 26.003$, $p = 0.000$). Of all the forms of surveillance, the study noted that CCTV cameras were the most widely used in secondary schools. That being said, the efficiency of their use in achieving safety objectives was somewhat hampered by operational obstacles. The study therefore suggests that while emphasizing on the use of additional technologies like fire alarms, burglar alarms, Metal detectors and Biometric systems, the school management boards in collaboration with Ministry of education and ICT should devise way of extending the use of such gadgets. Secondly, to guarantee full coverage of the school premises, it is necessary to step up investment in electronic security systems, and improve the support of personnel pertaining to the detection of threats.

Keywords: Effectiveness, Security Surveillance System, School Safety, Electronic Security Surveillance Systems

I. INTRODUCTION

Crime and safety threats in the United States of America (USA), Colorado State saw two students armed with guns in 1999, attack the school community and claim fifteen lives and kill themselves after the act (Monahan, 2006). In the United Kingdom, crime elevation in schools led to the installation of CCTV to remotely monitor and enhance the safety of students, teachers and supporting staff (Hope, 2009). There have been emerging issues related to the privacy of students, especially in classrooms, but with the mushrooming of sleeper cells in schools, it is necessary to monitor the students, teachers and facilities in school to enhance their safety and response (Taylor, 2010). Electronic Security Surveillance Systems such as CCTV potentially promote the security and safety of the school community from the increasing crime and threat to schools (Yorke, 2010). By 2011, more than 85% of UK secondary schools had installed CCTVs.

These past events have contributed to the school administration's investment in electronic security surveillance systems to monitor and enhance the safety of the school community (Perry-Hazan & Birnhack, 2018). Students are most vulnerable to social crimes thus ensuring their safety is observed, and monitoring their environment in school gains prominence over ethics (James & Nettikadan, 2019). Furthermore, James & Nettikadan (2019) posit that the combination of CCTV and alarm systems enhances response time to any potential threats to students, teachers and facilities. Concerns for insecurities as well as academic performance have led to schools employing the use of surveillance systems (Ghimire & Rana, 2022).

Electronic security surveillance systems have been established to improve security, in secondary schools (Hope, 2015; Stoycheff, 2016). Electronic security surveillance currently controls security structures in cities, airports,

terminals, traffic, supermarkets and malls among others which have improved transparency and mitigated security threats (Omolara et al., 2022). Schools have been recipients of threats from burglary, arson and radicalisation into violent extremist and terror attacks.

CCTV systems are among the most commonly used electronic surveillance technologies in schools. They involve the installation of cameras that transmit video footage to a central monitoring station. The primary purpose of CCTV is to deter and detect criminal activities and to provide evidence in case of incidents (Norris & Armstrong, 1999). Studies have demonstrated that CCTV systems can be effective in reducing crime rates in various settings, including schools. However, the effectiveness of CCTV systems is contingent upon several factors, including the quality of the cameras, the extent of their coverage, and the responsiveness of the monitoring staff (Welsh & Farrington, 2009).

1.1 Statement of the Problem

Global safety in educational institutions has increasingly been compromised, disrupting the proper functioning of school systems. In 2015, the United Nations General Assembly adopted the Post-2015 Agenda, which includes the 17 Sustainable Development Goals (SDGs). Among these, SDG 4 emphasizes ensuring inclusive and quality education for all, while promoting lifelong learning. Achieving this goal requires not only enrolling all children in school but also ensuring that schools function in a manner that prioritizes the well-being of the students. This involves creating safe and protective learning environments, staffed with adequately trained teachers, equipped with sufficient resources, and meeting necessary safety standards. However, schools face both internal and external security threats, which negatively affect their ability to sustain optimal performance.

In Kenya, secondary schools have experienced security challenges, including arson, terrorism, theft, and radicalization into violent extremism. These institutions have increasingly become targets for insecurity, with incidents such as burglary, arson, and terror attacks becoming prevalent. Traditionally, security personnel have been stationed at school gates but have lacked electronic surveillance systems capable of detecting potential threats, including lethal weapons that could endanger the school community and its facilities. Ensuring effective security measures is critical for maintaining continuity in education and promoting academic performance. Trans Nzoia County, in particular, has recorded numerous fire incidents in schools. These security concerns ranging from fires and bullying to attacks and theft motivated this study, which seeks to assess the impact of electronic security surveillance systems on secondary school safety in Trans Nzoia County, Kenya.

1.2 Research Objective

- (i) The objective of the study was to assess the effectiveness of electronic security surveillance systems on secondary school safety in Trans Nzoia County.

1.3 Research Question

- (i) What is the effectiveness of electronic security surveillance systems on secondary school safety in Trans Nzoia County?

II. LITERATURE REVIEW

2.1 Theoretical Review

The study opted to use two theories that were important to explain the variables in this study on ESSS (installed, monitors the threats, operational; threat detection, effective in monitoring, threat reduction; infrastructures, skilled personnel, installation location). Objective one and objective three were guided by Contingency theory and objective two was guided by situational theory.

2.1.1. Situational Crime Prevention Theory

The SCP, abbreviated for Situational Crime Prevention theory, was developed by the Criminological Research Department of the British Government in mid nineteen seventies (Clarke, 1995) with the motive of containing crime. Its goals are reduction of criminal behavior and prevention of crime by changing the factors that are temporarily or situationally connected with crime and its impact.

Schools face threats from diverse sources – internal and external threats thus vigilance becomes a major part of mitigating the threats (Smith and Clarke, 2012). Schools and other institutions endeavour to prevent crimes and threats in their compound by installing electronic security surveillance systems to monitor activities in and around schools. Electronic surveillance systems installed in appropriate places help monitor threats to property such as vandalism, burglary, bullying and substance use. Rationality must be employed by the school administration to help

protect the school community and the property. Altering the school environment by installing ESSS to prevent and mitigate crimes in the school compound. SCP seeks to change how potential offenders perceive opportunity in a particular environment or specific situation.

Electronic security surveillance systems make the potential offender that there is a high likelihood of getting caught after or before the fact. The perception of security is promoted by the presence of electronic security surveillance systems in schools. SCP attempts to change the perceptions of the information the potential offender processes regarding the gains, losses, and risks embodied in the situation. Electronic security surveillance systems are situational crime prevention. It is a perfect theory that applies to electronic security surveillance systems in schools thus looking at the strengths and weaknesses.

2.1.2 Contingency Theory

The study was also informed by the Contingency Theory which, as cited in Cole 1996 proposed that organizational and management solutions should reflect certain contingencies. This theory seeks to forecast an organization's behaviour based of people, structure, technology and its environment in order to ensure that the appropriate factor is put in place at the right time. Contingency theory bears relation to this study in terms of its basic tenets and goals. This stresses the requirement of setting adequate contingencies in organizational systems and requires specifying the work that is to be performed in detail beforehand. In this regard, the theory prompts an assessment of whether or not available infrastructures and environment designs are adequate in enhancing safety in schools. The movement of the variables in this study is also consistent with Otley's (1980) configuration of the contingency theoretical structure.

2.2 Empirical Review

Matczak et al. (2023) conducted a study examining the effectiveness of CCTV systems as a crime prevention tool, using data from eight Polish cities. The study aimed to determine whether closed-circuit television (CCTV) systems effectively reduce crime and if the impact of CCTV is lasting. Employing a quasi-experimental approach, the researchers analyzed police data on four types of crime incidents from 2005 to 2014 and considered camera placement. They found that CCTV had a preventive effect in 10 out of 17 paired treatment and comparison areas, though the overall impact was modest. The effects were durable in only two of the four crime categories analyzed. The findings indicate that while CCTV systems in these Polish cities contributed to a reduction in crime, the overall influence is limited and varies by crime type.

Atieno and Kinyanjui (2023) investigated the impact of technology on student discipline in public secondary schools in Nakuru County, Kenya. The study aimed to explore how closed-circuit television (CCTV) affects student behavior and discipline. Discipline is crucial for both academic success and the overall development of students. However, managing student discipline in Kenyan secondary schools remains a significant challenge, with many traditional techniques proving ineffective. The researchers employed an explanatory sequential mixed-methods design to compare schools that use CCTV and other technologies for discipline management with those that do not. The study involved ten schools, with five utilizing various technologies and five relying on conventional methods. The sample included 270 participants. The results revealed a positive correlation between the implementation of CCTV technologies and improved management of student discipline. Schools with CCTV systems demonstrated more effective discipline management compared to those without such technologies, suggesting that the use of CCTV can positively affect student behaviour and overall discipline.

Kirui et al. (2024) investigated the effects of CCTV systems on police operations in Nairobi City County, Kenya, focusing on five main areas: faster response, fighting crime, safer roads, sustainable safety for officers, and low expenses. Awareness of the security situation in Nairobi will remain low, Even though the CCTV system was put in place in mid- 2015, its effectiveness has not fully been ascertained yet. The study used cross-sectional survey research with a phenomenological study. There were attained from the CCTV command centre and different police stations leaving a total of 403 police officers who were randomly and purposively sampled. CCTV was found to have contributed greatly to the reduction in crime rate, road traffic accidents and thereby increase in officer safety and reduction in operation cost. However, issues such as response time only received slight improvement because of lack of forward-facing cameras and lack of cooperation between officers. Specifically, the study recommended increasing the scope of CCTV monitoring, increasing the effectiveness of the officers' cooperation, and highlighting successful events that happened in the system area in order to increase the effectiveness of the system's usage.

III. METHODOLOGY

3.1. Study Area

Trans Nzoia is among the forty-seven counties that were created by Kenya Constitution formulated in 2010 (Figure 1). It consists of five sub-counties: Kiminini, Saboti, Endebess, Kwanza, and Cherangany constituencies that are split into 25 wards in total. At the time of the 2019 Census, the population of the county was established to be 990,341, where 489,107 were men, 501,206 were women and there were 28 people of intersex. The county also has 223,808 households with average household size of 4.4 persons per household. Geographically, Trans Nzoia falls between latitudes $00^{\circ}52'$ and $10^{\circ}18'$ south of the equator and between longitude $34^{\circ}38'$ and $35^{\circ}23'$ east of the great Meridian. On its east it borders Uganda, on the south Bungoma and Kakamega, east west Pokot county while to the south east it borders Elgeyo Marakwet and Uasin Gishu counties (Government of Kenya [GoK], 2023).

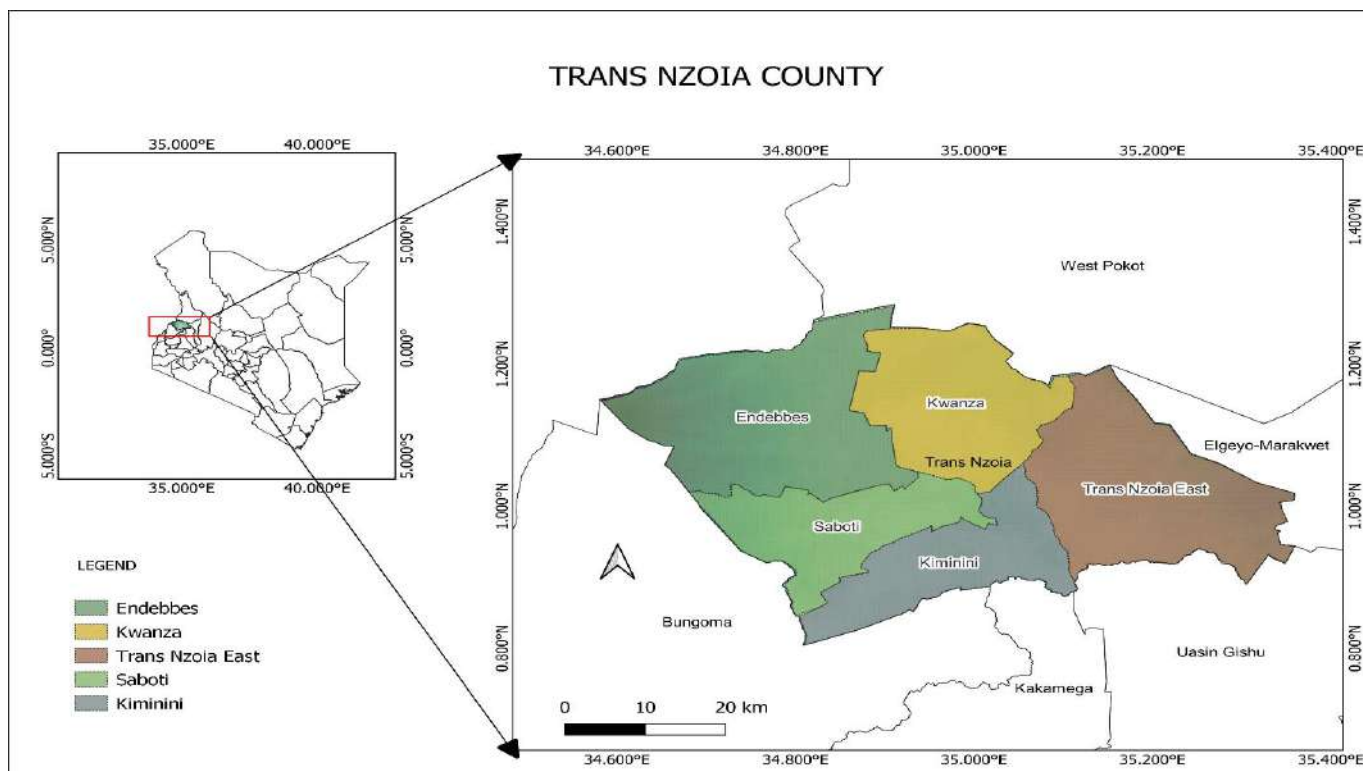


Figure 1
Map of Trans Nzoia County Showing Sub Counties

3.2 Research Design

This study utilized a descriptive survey research design, which blends both qualitative and quantitative approaches to provide accurate and relevant outcomes (Vanderstoep & Johnson, 2008). The research was conducted through surveys and observations of the presence of CCTVs, security alarms, and metal detectors at entry points and within school compounds. The descriptive survey research design was chosen for its ability to provide a comprehensive understanding of the effectiveness and application of ESSS in secondary schools.

3.3 Study Population

The study population comprised both day and boarding secondary schools in Trans Nzoia County. Out of the 225 secondary schools in the county, this study focused on 14 schools with a history of security threats and that had installed electronic security surveillance systems. The schools were purposively selected. These schools were selected as the units of analysis. The units of observation included school principals, teachers (including senior teachers and boarding masters for boarding schools), security officers, the County Director of Education, the Department of Disaster Management in Trans Nzoia County, and the Chief Fire Officer.



Table 1
Secondary Schools in Trans Nzoia Sub Counties with Previous History of Security Threats

Trans Nzoia Sub-County	Number of schools with past security threats
Kwanza	2
Kiminini	2
Trans Nzoia East	5
Tran Nzoia West	3
Endebess	2
Total	14

3.4. Sample Strategy and Sample Size Determination

According to the County Directorate of Education record in Trans Nzoia County, there are 14 secondary schools with a previous history of security threats. Secondary schools in Trans Nzoia County with electronic security surveillance systems and a previous history of security threats (arson, terrorism, theft) formed the unit of analysis in this study.

The study employed both quantitative and qualitative approaches. Simple random sampling and purposive sampling formed the sampling strategy. The purposive sampling strategy was used to secondary schools that have ESSS and a previous history of security threats. Students, security personnel, the County Director of Education and the Chief Fire Officer were purposively selected. A simple random sampling strategy was used to select the principals and the teachers. The population categories for the study are summarized in Table 2.

Table 2
Sampling Frame for Unit of Observation of Key Informants

Population category	Pop (N)	Sampling strategy	Samples size (n)
School Principals	14	Census	14
Deputy Principal	14	Census	14
Boarding teachers	14	Census	14
Security officers	14	Census	14
County Directors of Education	1	Purposive	1
Chief Fire Officer	1	Purposive	1
Students	10x7 FGDs	Quota	70

IV. FINDINGS & DISCUSSION

4.1 Effectiveness of Electronic Security Surveillance Systems on Secondary School Safety

The study sought to determine the effectiveness of electronic security surveillance systems on school safety. Figure 2 summarises the findings.

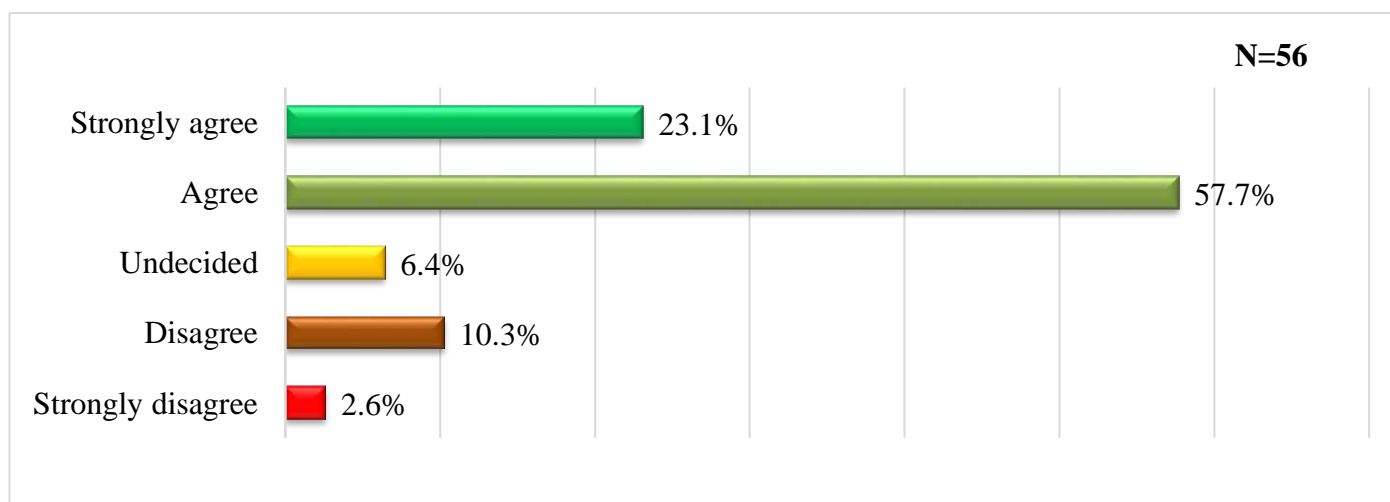


Figure 2
Effectiveness of Electronic Security Surveillance Systems on Secondary School Safety



Figure 2 shows that a majority of respondents believe electronic security systems promote safety in secondary schools. 57.7% agreed and 23.1% strongly agreed with this statement. Only 6.4% were undecided, while 12.9% (10.3% disagreed and 2.6% strongly disagreed) felt these systems did not improve safety. All participants in the focus group discussions (FGDs) supported the use of electronic security systems. They echoed the findings of Fisher et al. (2021), who identified surveillance cameras as one of the most common methods for preventing and detecting crime and violence in schools. This is in agreement with Matczak et al. (2023) who conducted a study examining the effectiveness of CCTV systems as a crime prevention tool, using data from eight Polish cities. The study aimed to determine whether closed-circuit television (CCTV) systems effectively reduce crime and if the impact of CCTV is lasting. They found that CCTV had a preventive effect in 10 out of 17 paired treatment and comparison areas, though the overall impact was modest. The effects were durable in only two of the four crime categories analysed.

4.1.1 Opinion from FDG on the Effectiveness of Electronic Security Surveillance Systems in Improving Secondary Schools’ Safety

The researchers sought to determine the effectiveness of ESSS use in ensuring the improvement of secondary school safety. Table 3 summarises the responses from FDG.

Table 3

Summary of the Opinion from a FDG on the Effectiveness of Electronic Security Surveillance Systems in Improving Secondary Schools’ Safety

Question	Responses					
	FGD 1		FGD 2		FGD 3	
	Frequency		Frequency		Frequency	
Has the use of electronic security surveillance systems at the main entrance reduced security threats in your school?	There are no electronic security surveillance systems particularly installed at the gate to monitor threats	7	There has been a tremendous reduction of threats as the conspirators take caution	6	The work of the security personnel has been lessened as the people’s behaviour when approaching the gate has indicated changes for the better	8
	The one ESSS that could have helped at the main entrance is far from there hence not convinced of its effectiveness	3	Indeed. There has been increased sensitivity around the school compound	4	There is a change of behaviour around the gate with ESSS	2
Is it in your opinion that security threats have been detected by the use of ESSS?	Sneaking of students has been detected	3	ESSS has captured some students sneaking out of school	4	Classroom theft has been caught in action	6
	Theft among students	7	Theft case have been caught in action among the students	6	Bullying and harassment among students in class	4
Has monitoring of security threats by ESSS been effective?	There has been a reduction in security threats, especially thefts	10	There has been a reduction in theft in the school	10	There has been modification of behaviours thus leading to a reduction in theft and other threats.	10

The findings in Table 3 have shown that 12 (40%) respondents that there had been a tremendous reduction of threats as the conspirators took caution when at the school precincts. Behaviour modification of the individual around the school gate has lessened the risk that would otherwise have resulted in threats to the school safety as said by 8 (26.7%) respondents. There were 7 (23.3%) respondents who said that their school did not have electronic security

surveillance systems at the gate. Thus, their gates only relied on the physical security personnel who did not have any of the ESSS for use.

There has been detection of threats by the use of ESSS in schools. Nineteen (63.3%) respondents said that thefts were caught on camera in real-time and verified upon request for reviews. This was actively helping address the inherent theft cases that have been a plague in secondary schools especially boarding schools. A side note from one of the school principals in a girls' school said that:

"... CCTV has helped manage bad behaviors in school as the student feels awkward that she is monitored by the 'big sister'. Stealing has been lessened but not gotten rid off yet. I am planning to install CCTVs in the dormitories, maybe which can address dormitory theft."

The study found that sneaking has been one of the issues exacerbating security threats in the school. It was revealed by 7 (23.3%) respondents that sneaking had been rampant in their school. In the modern dispensation, it was discovered that bullying was a thing in secondary schools where 4 (13.3%) respondents said that bullying was mitigated by the use of electronic security surveillance systems in secondary schools. The use of electronic security surveillance systems has been a great addition to mitigating theft cases in secondary schools. It was revealed by all the participants of the FGD in Table 3 that ESSS has been effective in detecting threats in the schools' precincts. However, this was in contradiction to a study that was done in Israel. Israel students' works published demonstrated that students are very much disappointed and constantly complaining about surveillance practices in school. For example, Birnhack and Perry-Hazan (2020) established that high school students considered the surveillance with CCTV cameras as illegitimate, as well as a sign of lack of trust between teachers and students with physical and digital confrontations relating to privacy and security. However, research carried out in Australia (Miear, 2006; Nemorin, 2017) highlighted that teachers as well as students positively accepted surveillance and common image presence by considering CCTV cameras as a regular part of one's school day without much concern.

4.1.2 Effectiveness of Electronic Security Surveillance Systems in Improving Secondary Schools' Safety

The study looked at individual variables that contributed to the effectiveness of the electronic security surveillance systems in improving and promoting secondary school safety in Trans Nzoia County. The Table 4 summarises the findings.

Table 4

Effectiveness of Electronic Security Surveillance Systems in Secondary School has Improved Safety

Effectiveness of ESSS in improving secondary school safety	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Electronic security surveillance systems have been detecting threats in schools	7.7%	23.1%	3.8%	46.2%	19.2%
Electronic security surveillance systems have designated operation personnel for monitoring and instant reporting of threats	6.4%	19.2%	10.3%	56.4%	7.7%
Electronic security surveillance systems have curbed the threats (theft, bullying, vandalism, radicalization into extreme violence and terror attacks) in this school	3.8%	1.3%	2.6%	71.8%	20.5%
Electronic security surveillance systems monitor and secure the entire school's operations and activities	0.0%	11.5%	6.4%	52.6%	29.5%
Electronic security surveillance systems have made students, teachers and visitors conscious of how they behave in the school compound	0.0%	5.1%	5.1%	59.0%	30.8%
The use of electronic security surveillance systems at the point of entry into the school precinct has reduced security threats	2.6%	3.8%	7.7%	59.0%	26.9%

The Role of Electronic Security Surveillance Systems in Detecting Threats in Secondary Schools

Findings in Table 4 show that 36 and 15 respondents agreed and strongly agreed that electronic security surveillance systems have been detecting threats in the schools. There are 3 respondents (3.8% of the total respondents) were undecided that electronic security surveillance systems have been detecting threats in the schools. Contrary, 18 and 6 respondents disagreed and strongly disagreed that electronic security surveillance systems have been detecting threats in the schools according to 23.1% and 7.7% (of the total respondents) respectively.

Findings (Table 4) show that 44 and 6 respondents that electronic security surveillance systems have designated operation personnel for monitoring and instant reporting of threats according to 56.4% and 7.7% (of the total respondents) respectively. There are 8 respondents (10.3% of the total respondents) who were undecided as to

whether electronic security surveillance systems have designated operation personnel for monitoring and instant reporting of threats. Contrary, 15 and 5 respondents disagreed and strongly disagreed that electronic security surveillance systems have designated operation personnel for monitoring and instant reporting of threats according to 19.2% and 6.4% respectively.

Effectiveness of Electronic Security Surveillance Systems in Monitoring Threats in Secondary Schools

Findings from Table 4 show that 40 respondents (71.8%) agreed and 11 respondents (20.5%) strongly agreed that electronic security surveillance systems have curbed threats. Only one respondent (2.6%) was undecided. On the contrary, one respondent (1.3%) disagreed, and two respondents (3.8%) strongly disagreed with this statement. Additionally, the findings show that 29 respondents (52.6%) agreed and 17 respondents (29.5%) strongly agreed that electronic security surveillance systems monitor and secure the entire school's operations and activities. Four respondents (6.4%) were undecided, while 6 respondents (11.5%) disagreed.

A study conducted by Kirui et al. (2024) investigated the effects of CCTV systems on police operations in Nairobi City County, Kenya, focusing on five main areas: faster response, fighting crime, safer roads, sustainable safety for officers, and low expenses. Awareness of the security situation in Nairobi will remain low, Even though the CCTV system was put in place in mid- 2015, its effectiveness has not fully been ascertained yet. CCTV was found to have contributed greatly to the reduction in crime rate, road traffic accidents and thereby increase in officer safety and reduction in operation cost. However, issues such as response time only received slight improvement because of lack of forward-facing cameras and lack of cooperation between officers.

Mitigating Threats in Secondary using Electronic Security Surveillance

Findings (Table 4) show that 30 and 17 respondents agreed and strongly agreed that electronic security surveillance systems have made students, teachers and visitors conscious of how they behave in the school compound according to 59% and 30.8% respectively. The indecision from the statement 'electronic security surveillance systems have made students, teachers and visitors conscious of how they behave in the school compound' was occasioned by 3 respondents (5.1% of the total respondents). Contrary, only 3 respondents (5.1% of the total respondents) disagreed that electronic security surveillance systems have made students, teachers and visitors conscious of how they behave in the school compound.

Finally, the findings in Table 4 show that 33 and 15 respondents agreed and strongly agreed that the use of electronic security surveillance systems at the point of entry into the school precinct has reduced security threats according to 59% and 26.9% respectively. Indecision on the statement - that the use of electronic security surveillance systems at the point of entry into the school precinct has reduced security threats - was occasioned by 4 respondents (7.7% of the total respondents). Contrarily, 2 and 1 respondents disagreed and strongly disagreed that the use of electronic security surveillance systems at the point of entry into the school precinct has reduced security threats according to 3.8% and 2.6% respectively.

4.1.3 Opinion of Key Informants on the Effectiveness of ESSS on Secondary School Safety

The study sought to know from the respondents whether monitoring of security threats by electronic security surveillance systems increased the safety of the entire secondary school community in Trans Nzoia County. This is what the respondent said:

".... normally, whenever people visit the school upon seeing the camera have been well-behaved to avoid being recorded doing things that are contrary to the school values. So yes, schools are a lot safer giving an advantage to the entire security system."

The study further sought to establish whether monitoring of security threats by electronic security surveillance systems increased the safety of the entire secondary school community in Trans Nzoia County. The respondent said:

"... Yes continuous monitoring of security threats by electronic security surveillance systems increases the safety of the entire secondary school community. This is true because surveillance always scares even the strongest offenders as they know that they are watched round the clock hence, making the school spaces much safer."

This was the implication that if schools would only use the electronic security surveillance systems appropriately and ensure monitoring round the clock, schools would be safer compared to the absence of the security systems in place.

4.2 Safety in Secondary Schools

The study sought to determine the secondary school safety status. Figure 3 summarises the findings. Findings show that 40 (70.5%) and 10 (17.9%) of the respondents agreed and strongly agreed that electronic security

surveillance systems provided safety in secondary schools. Further, 4 (6.4%) were undecided, 2(3.8%) disagreed while 1(1.3%) strongly disagreed.

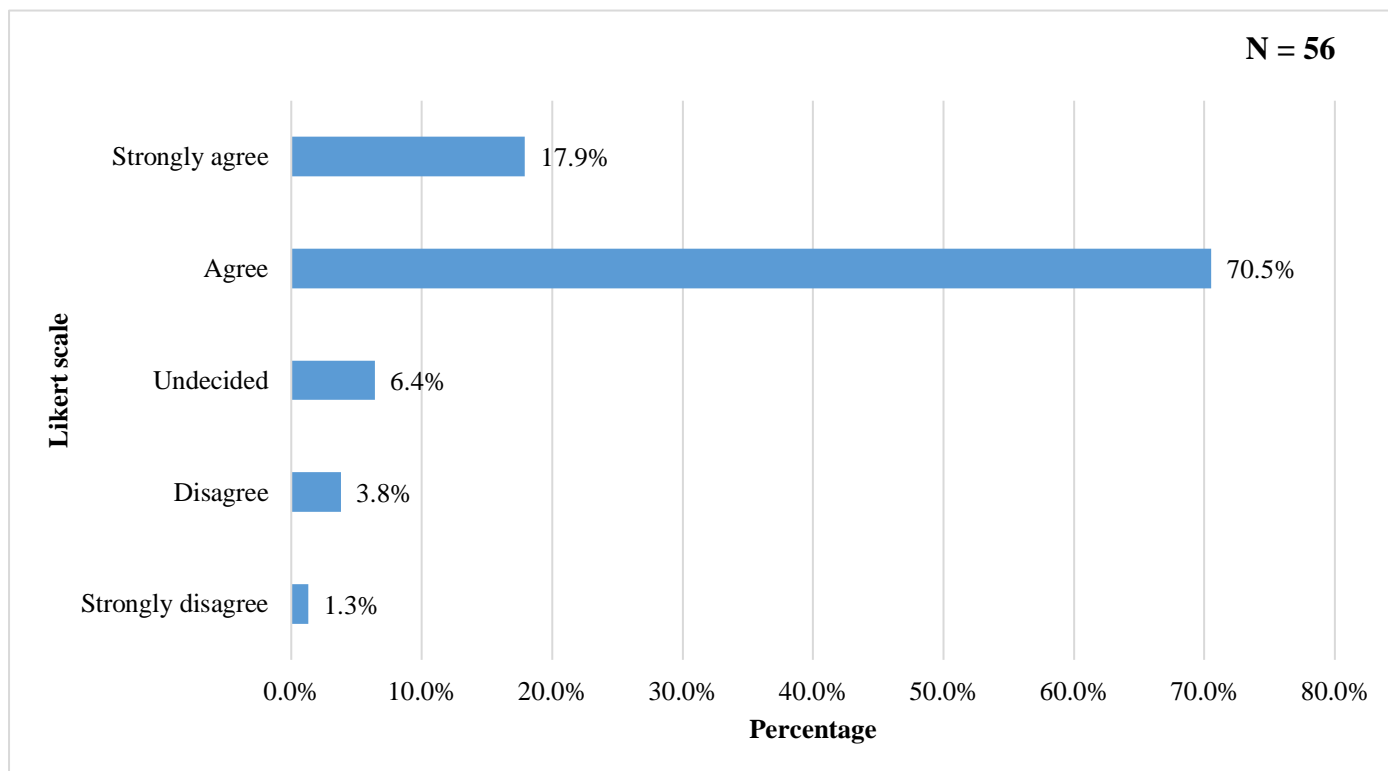


Figure 3
Role of Electronic Security Surveillance Systems in Ensuring Secondary School Safety

This study agrees with Perumean-Chaney & Sutton (2013) in their article “School Security measures” which state that one of the important of the school context include the presence of physical security measures, especially those that focus on the monitoring and control of students such as security guards and security cameras. In educational environment, one term connected to school security school safety, which is defined as the sheltering of students from violence and bullying.

4.3 Regression Model on the Effectiveness of Electronic Security Surveillance Systems in Enhancing Secondary School Safety

The regression linear and hierarchical – model was computed to ascertain the effectiveness of electronic security surveillance systems on secondary school safety and the intervention of implementation of national ICT policy and secondary school safety. The null hypothesis for this section was that: the effectiveness of electronic security surveillance systems on safety does not promote secondary school safety (Table 5).

The first linear regression model shown in Table 5 reveals an $R^2 = 0.184$ meaning that the application of electronic security surveillance systems enhances the safety of the secondary schools to an overall extent that is probabilistically associated to overall school safety with ($F(1,76) = 17.112, p = 0.000$). The model also revealed that percentage variance between the effectiveness of these systems and the increased safety in secondary schools is 18.4% which is moderate. With $p=0.000 < \alpha = 0.05$ the null hypothesis is rejected indicating that electronic security surveillance systems in enhancement of safety do have an effect on safety in secondary schools



Table 5

Regression Model on the Effectiveness of Electronic Security Surveillance Systems in Enhancing Secondary School Safety

<i>Model Summary</i>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.429 ^a	0.184	0.173	0.655		
2	0.640 ^b	0.409	0.394	0.561		
<i>ANOVA^a</i>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.351	1	7.351	17.112	0.000 ^b
	Residual	32.649	76	0.430		
	Total	40.000	77			
2	Regression	16.379	2	8.190	26.003	0.000 ^c
	Residual	23.621	75	0.315		
	Total	40.000	77			
<i>Coefficients^a</i>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.758	0.309		8.922	0.000
	Effectiveness of electronic security surveillance systems on promoting safety in secondary schools	0.320	0.077	0.429	4.137	0.000
2	(Constant)	1.159	0.399		2.903	0.005
	Effectiveness of electronic security surveillance systems on promoting safety in secondary schools	0.254	0.067	0.341	3.777	0.000
	Intervening variables (national ICT policy and school safety policy)	0.479	0.089	0.483	5.354	0.000
Dependent Variable: Secondary School Safety						

Probably from the linear regression model 1 finding (Table 5), there is an association between the effectiveness of electronic security surveillance systems in secondary school improved safety and secondary school safety. Therefore, it means that electronic security surveillance systems were effective in promoting and improving secondary school safety.

The hierarchical regression model 2 presented in the Table 5, indicating that the results of the research with $R^2 = 0.409$, $(F(2, 75) = 26.003, p = 0.000)$ shows that the effectiveness of electronic security surveillance systems in increasing the security of secondary schools is statistically significant predictors of the intervention of the national ICT policy in education and the school safety policy. Based on the research evidence, it is evident that the implementation of electronic surveillance system has an effect of 40.9% on school safety in secondary school. The p-value of 0.000, which is below the significance level of $\alpha = 0.05$, leads to the rejection of the null hypothesis. This confirms that the effectiveness of electronic security surveillance systems significantly contributes to enhancing safety in secondary schools.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

This paper therefore concludes that the use of electronic security surveillance systems has worked positively towards contributing to improvement of safety among secondary school. They have become increasingly useful and highly contributed to the increase in the levels of security in schools. In addition, other measures among them being the national ICT policy and safety on policies regarding secondary schools have contributed to safety.

5.2 Recommendations

The use of electronic security surveillance systems has led to a conducive and threats-free environment in secondary schools mitigating security threats. There should be more investment in electronic security surveillance systems to cover the entire school precinct and provide the necessary support to the responsible personnel to affect the reporting of threats.

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