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Nature and Extent of Electronic Security Surveillance Systems in Secondary School Safety in Kenya

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ABSTRACT

Secondary safety is paramount to the sustainability of school performance; however, threats leveled against schools globally are interfering with safety. Schools in Kenya have experienced a horde of threats such as fire and theft coupled with radicalization. There is hardly the use of electronic security surveillance systems to mitigate threats. In Trans Nzoia County, secondary schools have been a recipient of security threats threatening the safety of the school community. Against this backdrop, this study assessed the influence of electronic security surveillance systems on the sustainability of secondary school safety in Trans Nzoia County, Kenya. The specific objective of the study was to establish the nature and extent of electronic security surveillance systems in secondary schools in Kenya. The descriptive survey research design was used to study electronic security surveillance systems in secondary school safety in Trans Nzoia County. The study population was composed of 14 secondary schools that had previous security threats and had installed electronic security surveillance systems (unit of analysis). The sampling strategy in this study was simple random and purposive sampling. Quantitative data was analyzed descriptively and inferentially with the aid of SPSS version 25. The data was analyzed at a 0.05 probability level and presented in tables and figures in percentages and frequencies. Results: CCTV was installed in all the secondary schools surveyed sampled. It was agreeable by the respondents (76.9%) that the nature and extent of electronic security surveillance systems in secondary schools promoted safety in the school community. The interaction between the electronic security surveillance systems installed in schools and the implementation of national ICT policy and school safety policy had a 29.9% impact on promoting safety in secondary schools ($R2 = 0.299$, ($F(2, 75) = 15.966$, $p = 0.000$). About 80.8% of the respondents agreed that electronic security surveillance systems effectively promote safety in secondary schools.

KEYWORDS: Nature, Extent, Security Surveillance System, Secondary School, Radicalization, School Community

1. Introduction

School security covers all actions put in place to protect against threats happening to people and their properties in the education environment (Goodwin, 2016). School safety or security as it implies in other sources has been defined as the shelter of students from violence and bullying, as well as exposure to harmful elements such as drugs, fire disasters, and gang activity (Safe Supportive Learning, 2018). Just like other places school is a place that can be at risk of attack from the outside as well as attack from students because of high traffic of potential assailants and availability of victims, who can harm or harm others, which can also bring a mass destruction of the school environment and the academic activities in the school.

Globally, schools are facing security lapses that are increasing their risk levels regarding both internal and external threats such as arson and terrorism (Hussain, 2016). Rising insecurity cases in schools have brought a paradigm shift into installing closed-circuit television (CCTV) systems to monitor students' movements and enhance security (Birnhack *et al*., 2018). The electronic visitor management (EVM) and Easy LobbyTM devices installed in schools provide both physical safety and virtual safety (internet access) safeguarding students and teachers from security threats (Leaton-Gray, 2018). Electronic security surveillance systems have been designed to mitigate the upsurge of criminal cases arising in schools (Kamal, 2018). These CCTVs have been proven efficient in monitoring the students' movement for any potential risk and thus promoting safety measures (Zhang *et al*., 2019; Shoh & Ahmed, 2019).

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Secondary schools in Trans Nzoia County have been recipients of attacks, especially fires whose origin has been attributed to arson attacks (Wamalwa, 2015; Mwangi, 2016). Moreover, the arson attacks in secondary schools in Trans Nzoia County have been attributed to unruly students' behavior such as the use and abuse of substances and peer pressure (Akoko, 2017). The schools have been mainly relying on physical security guards to enhance the security of schools. Safety is a serious concern in schools, where most electronic systems are in operation thus exposing the students, teachers, and facilities to potential risks that may be deleterious. According to the Kenya Data Protection Act, (2019) the protection of the vital interests of the data subject or another natural person is lawful. The students, teachers, and the rest of the school community. The safety of school children is guaranteed in the safety standards manuals for schools in Kenya (Government of Kenya, 2008). This study sought to assess the influence of electronic security surveillance systems on the sustainability of secondary schools' safety in Trans Nzoia County, Kenya.

2. Methodology

2.1 Research Design

This study used a descriptive research design. Descriptive research design blends both qualitative and quantitative approaches that endeavor to provide accurate and relevant outcomes (Vanderstoep & Johnson, 2008). Thus, this research was conducted via survey and observation of the presence of CCTVs, security alarms, and metal detectors at the point of entry and in the school compound. This design was helpful to this study helped to conceptualize the extent and application of electronic security surveillance systems.

2.2. Study Area

Trans Nzoia County was the study area with a specific focus on secondary schools with a previous history of security threats despite having installed electronic security surveillance systems. From the past incidences of arson attacks in various schools in Trans Nzoia County, it was paramount that secondary schools endeavor to invest in modern electronic security surveillance systems to enhance students', teachers', and facilities' safety from threats. ICT is key in ensuring a holistic approach to enhance the sustainability and safety of students, teachers, and facilities in terms of the installation of monitoring devices such as CCTVs, alarms, and metal detectors.

The researcher acknowledges previous studies that reported on the security threats in secondary schools connected with electronic security surveillance systems in Trans Nzoia County. There have been several cases involving secondary school breakage, theft, and vandalism in Trans Nzoia County (Akoko, 2017). Electronic security surveillance systems such as CCTVs have been stolen, which exacerbates the safety of the students, teachers, and facilities in schools. Owing to these reports, it was important to investigate the sustainability of electronic surveillance systems to establish the safety and security of the students, teachers, and facilities in schools, especially from arson, vandalism, and theft.

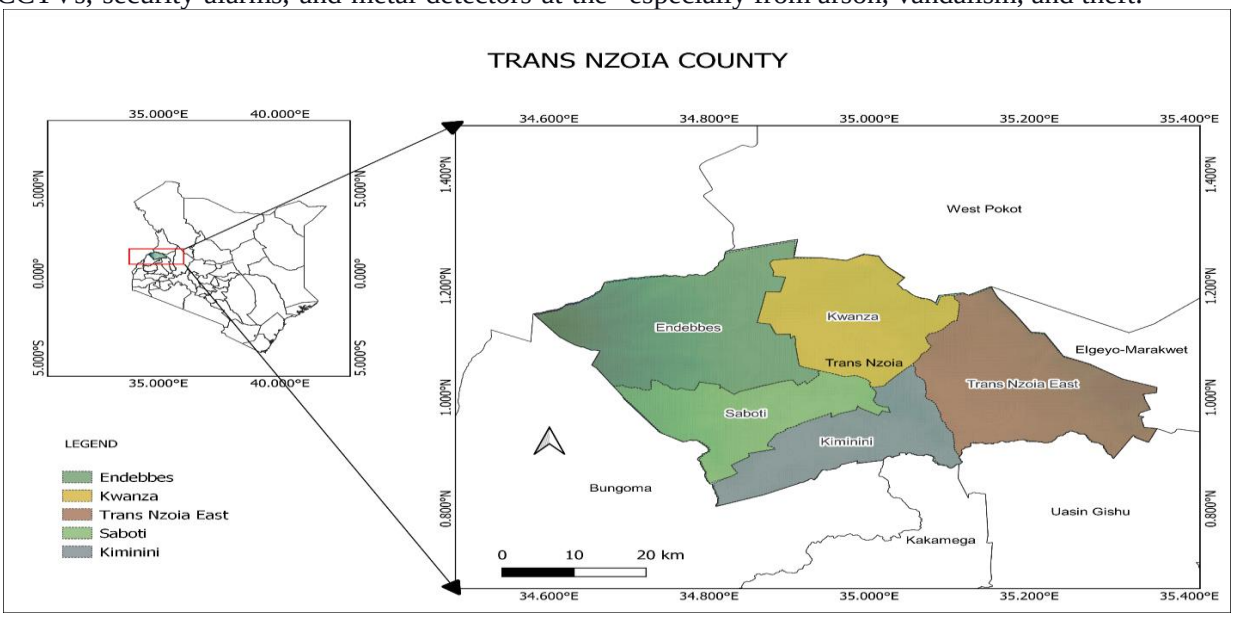

Figure 1: Map of Trans Nzoia County showing Sub Counties

2.3 Sampling Methods and Data Collection

According to the County Directorate of Education record in Trans Nzoia County, there were 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. Fourteen secondary schools in Trans Nzoia have ESSS and a previous history of threats.

The study employed both quantitative and qualitative approaches. Simple random sampling and purposive sampling formed the sampling strategy. The purposive sampling strategy was subjected to secondary schools that have ESSS and a previous history of security threats. Students, security

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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.

Data collection is the process of gathering qualitative and quantitative information for analysis purposes in research, (Bogdan & Biklen, 2007). Both Primary data and secondary data were collected. The study used a mixed approach where both quantitative and qualitative data were used to address the research questions.

3. Results and Discussion

3.1. Interventions for the promotion of a conducive and safe secondary school environment.

The researcher sought to determine if the heads of the secondary schools have intervened in the promotion of a conducive and safe teaching and learning environment in the schools. Figure 4.3 summarizes the findings.

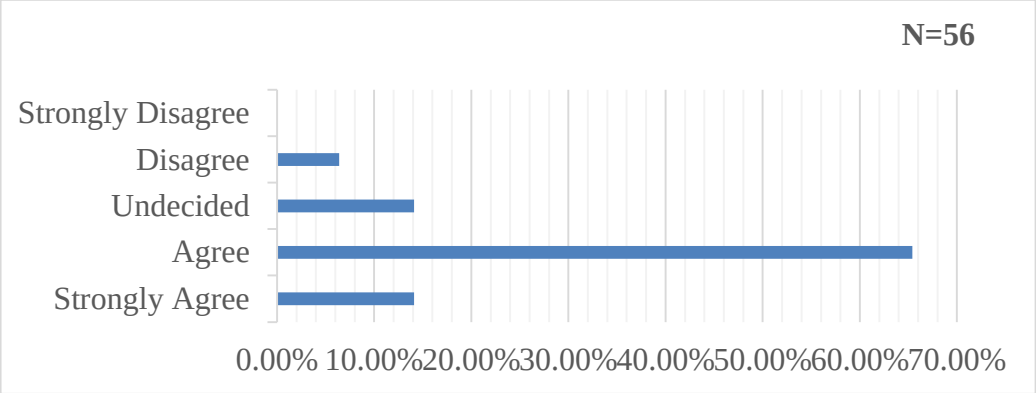

Figure 2: Intervening for secondary school safety by the use of electronic security surveillance systems

Findings in Figure 2 show that 36 (65.4%) agreed that there have been put in place interventions to provide a safe learning environment 8 (14.1%) of the respondents strongly agreed and 8 (14.1%) were undecided. This was in agreement with the FGDs with students, most of the FGDs were informed by the study that school head teachers had put in place security measures to ensure that students were safe. The study was informed that this was necessitated by the insecurity the schools had experienced. However, a few FGDs informed the study that some school head teachers were not as committed to student security as they should.

3.2: Secondary school safety from the use of electronic security surveillance systems

The study sought to determine the secondary school safety status. Figure 4.4 summarizes the findings.

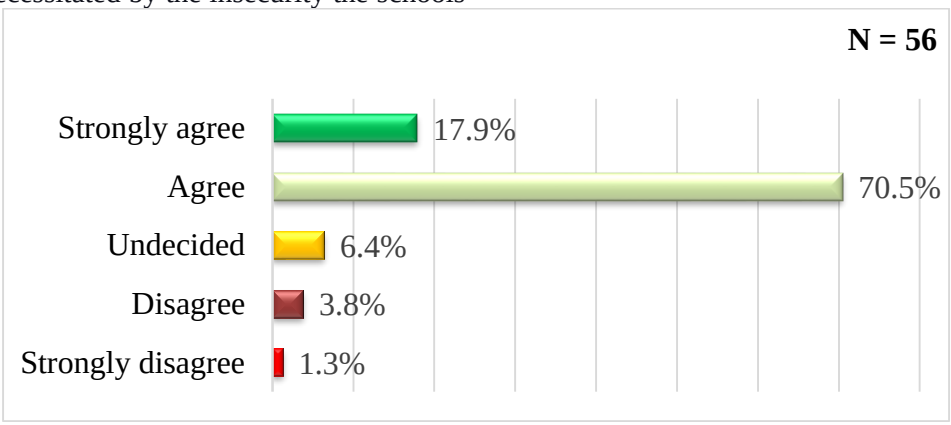

Figure:3 Secondary school safety as provided by the use of electronic security surveillance systems

Findings in Figure 3 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. This study agrees with Chris *et al.*(2019) in their article "School Security Measures" which states that one of the importance of the school context includes 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 an educational environment, one term connected to school security is school safety, which is defined as the sheltering of students from violence and bullying.

2.3 Electronic security surveillance systems installed in secondary schools

The study sought to establish the type of electronic security surveillance systems installed in schools as shown in Figure 4.5.

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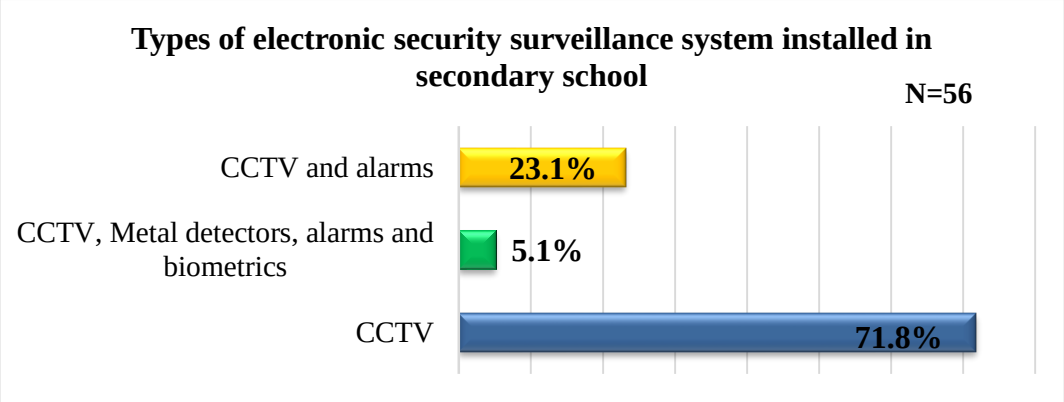

Figure 4: Types of electronic security surveillance systems installed in secondary schools

Findings in Figure 4 show that 40 respondents said that secondary schools had only installed CCTVs according to 71.8% of the total respondents. From the findings (Figure 4), 13 respondents said that secondary schools had both CCTVs and alarms according to 23.1% of the total respondents. Finally, 3 respondents said that secondary schools had CCTVs, metal detectors, alarms, and biometrics according to 5.1% of the total population. The findings noted that CCTV was available in all the schools that were surveyed that had a previous history of safety threats. It further shows that the school management took up the installation of CCTV because it provided a monitoring platform of the events unfolding in the school compound at a remote place such as the principal's office. This was in line with a previous study which acknowledged that CCTVs supported instant coverage of the school compound and the activities therein (Wang *et al.*, 2017). The observation checklist revealed that the CCTV servers in schools were installed in the Principal's office. The reason behind the installation of CCTVS servers in the Principal's office was occasioned by the lack of a designated technician to monitor and manage CCTVs.

2.3 Regression Model of the nature and extent of electronic security surveillance systems in promoting secondary school safety

The study computed linear and hierarchical regression to determine the nature and extent of electronic security surveillance systems in terms of secondary school safety and of the intervention taken to ensure secondary school safety. Table 4.7, summarizes the findings.

Table 1: Linear and hierarchical regression model-nature and extent of electronic security surveillance systems on secondary school safety.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.171[a]	0.029	0.017	0.715
2	0.546[b]	0.299	0.280	0.612

ANOVA[a]

Model		Sum of Squares	*Df*	Mean Square	*F*	Sig.
1	Regression	1.173	1	1.173	2.295	0.134[b]
	Residual	38.827	76	0.511		
	Total	40.000	77			
2	Regression	11.945	2	5.972	15.966	0.000[c]
	Residual	28.055	75	0.374		
	Total	40.000	77			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*T*	Sig.
1	(Constant)	3.584	0.286		12.536	0.000
	Nature and extent of electronic security surveillance systems on secondary school safety use in promoting safety in secondary schools	0.107	0.070	0.171	1.515	0.134
2	(Constant)	1.850	0.405		4.563	0.000
	Impact of nature and extent of electronic security surveillance systems on secondary school safety use in promoting safety in secondary schools	0.024	0.062	0.039	0.393	0.695
	Intervening variables	0.531	0.099	0.535	5.366	0.000

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Linear regression model 1, R^2 = 0.029, (F (1, 76) = 2.295, p = 0.134) shows that the nature and extent of electronic security surveillance systems installation in secondary schools were statistically insignificantly unrelated to secondary school safety (Table 1). There is about 2.9% variance between the nature and extent of electronic security surveillance systems and secondary school safety which indicates a low impact. Linear regression in the model (Table 1) shows that the p-value is 0.134 and greater than the significance level, α = 0.05, hence the null hypothesis that the nature and extent of electronic security surveillance systems do not promote secondary school safety were independent and failed to be rejected.

Probably from the linear regression model 1 finding (Table 1), there is no association between the nature and extent of electronic security surveillance systems promoting secondary school safety and secondary school safety. Therefore, it means that there could be other factors that contributed to secondary school threats that were managed by the nature and extent of electronic security surveillance systems.

The hierarchical regression model 2 (Table 1), R^2 = 0.299, (F (2, 75) = 15.966, p = 0.000) shows that the nature and extent of electronic security surveillance systems installation in secondary schools were statistically significantly related to secondary school safety by the intervention of the implementation of national ICT policy in education and the school safety policy. The findings mean that the installation and operation of electronic security surveillance systems have a 29.9% impact on the promotion of secondary school safety. Hierarchical regression in the model (Table 1) shows that the p-value is 0.000 and less than the significance level, α = 0.05, hence the null hypothesis that the nature and extent of electronic security surveillance systems do not promote secondary school safety were independent is rejected.

From the hierarchical regression model, 2 findings (Table 1) Implementation of the national ICT policy in secondary schools and individual school safety policy (B= 0.531, t = 5.366, p = 0.000) is significantly associated with the promotion of secondary school safety. Probably, there is an association between the nature and extent of electronic security surveillance systems promoting secondary school safety and secondary school safety through the implementation of national ICT policy and school safety policy. Implementation of national ICT policy and school safety policy help provide necessary infrastructure and services such as internet and hardware systems that run the electronic security surveillance systems. Secondary schools that installed electronic security surveillance systems and had applicable national ICT policy and school safety policies had mitigated security threats.

4. Conclusion

CCTVs were the most preferred type of electronic security surveillance system by secondary schools. CCTV provides a visual monitoring of activities in schools either from a single control room or on a smartphone hence is convenient. Alarms, metal detectors, and biometrics were uncommonly installed and applicable in schools. Schools had installed electronic security surveillance systems between one and nine years congruent to the period frequented with threats in schools such as fire outbreaks and theft. The study noted that the nature and extent of electronic security surveillance systems promoted safety in secondary schools. Moreover, the application of national ICT policy and enforcement of secondary safety policy promoted school safety through the use of electronic security surveillance systems.

5. Recommendation

CCTVs are widely used by schools to monitor activities and threats in the school compound and its neighborhood. However, alarms, metal detectors, and biometrics are hardly applicable whilst they are crucial to detecting threats and mitigating deleterious outcomes. Therefore, the secondary schools' board of management, the Ministry of Education, and the Ministry of ICT should collaborate to expand on the use of other electronic security surveillance systems such as fire alarms, burglary alarms, metal detectors, and biometrics to ensure the safety of the school community.

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