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Improving Internal Security in Public Tertiary Institutions in Nigeria Using Information and Communication Technology (ICT) and Geographic Information System (GIS) for Enhanced Skills Development: A Study of Shehu Shagari College of Education, Sokoto

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ABSTRACT
Internal security in Nigerian public tertiary institutions has become increasingly critical due to growing threats such as theft, cultism, vandalism, and unauthorized access. This paper explores the potential of integrating Information and Communication Technology (ICT) and Geographic Information System (GIS) to enhance internal security while also fostering skills development among students and staff. Using Shehu Shagari College of Education, Sokoto, as a case study, the research investigates existing security challenges and examines how ICT tools (such as surveillance systems, biometric access control, and emergency communication channels) and GIS mapping (for real time monitoring and spatial analysis of threats) can be harnessed for both prevention and response. The findings suggest that beyond improving safety, such integration promotes capacity-building, digital literacy, and practical GIS skills among the college community critical for 21st century workforce readiness.
Keywords: skills development, Geographic Information System, Information and Communication Technology

INTRODUCTION

The security of lives and property within educational environments is pivotal to academic progress, peace, and institutional development, in recent years, Nigeria has witnessed increased incidents of insecurity in tertiary institutions, ranging from petty crimes to organized assaults, making internal security a major concern. Traditional security approaches have proven insufficient, necessitating the adoption of more dynamic and technologically advanced strategies (Adeoye, and Aluko 2021).

Insecurity is a state of being subjected to danger or injury on the other hand, crime is one of the continuous problems that bedevil the existence of mankind. Since early days, crime has been a disturbing threat to man's personality, property and lawful authority (Ayuba, Mugu, Tanko and Bulus, 2016). Internal insecurity in tertiary institutions refers to safety threats that originate within or directly affect the campus community, including theft, cultism, violence, gender-based harassment, intrusion, and vandalism. These challenges disrupt academic activities, erode trust, and reduce institutional productivity (Adetoro and Ogunleye, 2019)

Similarly, Nigeria's security environment has changed significantly over the past ten years, with a rise in kidnapping and banditry incidents endangering the nation's advancement, especially in the area of education. Violent criminal activity has been targeting tertiary institutions more and more, despite the fact that they are essential to the development of the country through research, innovation, and capacity building. The effects of these attacks are extensive and include psychological trauma in the impacted communities, delayed infrastructure development, and disruption of academic calendars and staff and student withdrawal (Eimunjeze and Ehikhamenle 2025), it should be noted that, Security situation is one of the important components of the infrastructure that must be in place for the adequate security of our immediate communities (Charles et al,2005).

Information technology is impacting all walks of life all over the world its developments have made possible a transition in information storage, processing, and dissemination, from paper to virtual and from atoms to bits, which are now setting new standards of speed, efficiency, and accuracy in human activities (Bassey2020). ICT is a broad term referring to multitude of means which can serve for storage, dissemination, replication of all types of knowledge and information (Nwokedi and Nwokedi, 2018).

Information and Communications Technologies (ICT) are broad term which is currently used to describe wide range of tools, applications, and various types of equipment and software which often run over telecommunication networks. It is of no dough to say that ICT became the all round term that is applicable in all our day to day activities across the globe, generally is a phenomenal tool that can lead to the improvement of high performance of services (Abdullahi and Suleman, 2020), Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced information. It uses data that is attached to a unique location. Most of the information we have about our world contains a location reference (Ajayi and Oladipo, 2022).

Similarly, GIS functions within an institutional context as both a tool for safety management and a platform for developing digital and spatial skills. However, internal security in tertiary institutions in Nigeria is a critical concern due to increasing cases of theft, cultism, vandalism, violence, cybercrime, and even terrorist threats. Security management within campuses demands effective monitoring, rapid response, and strategic decision-making. Geographic Information Systems (GIS) offer innovative tools for mapping, monitoring, analyzing, and managing security threats in educational environments (Ahmed, 2020).

The application of ICT and GIS in public sectors cannot be over emphasis, it has the potentials to ease the workloads in our public sectors and provide a wide solution to an existing problem and increase efficiency of our organizational operations, as such, ICT and has the potentials to enhance services in various aspect of human endeavour, such as education, security, health sector and financial institutions etc. This paper advocates for a dual purpose integration of ICT and GIS in public tertiary institutions, especially at Shehu Shagari College of Education, Sokoto not only to bolster internal security but also to serve as a platform for enhancing digital and spatial analytical skills among students and staff.

ICT and GIS in Security: Conceptual Overview

Information and Communication Technology (ICT) in Security

ICT refers to the use of digital technologies such as computers, internet networks, CCTV cameras, biometric systems, and communication devices to collect, transmit, and analyze data for security purposes. In campus security, ICT facilitates Real time surveillance (CCTV systems) Incident reporting

(hotlines, mobile apps), Biometric access control and Security database management (Muhammad et al, 2019).

Now a day, Information and Communication Technology (ICT) plays a crucial role in the maintenance of both external and internal security of our immediate communities. The term ICT is an umbrella term that encompasses a range of technologies used for communication, data processing, storage, and retrieval. In addition, within the context of internal security, ICT is used to support law enforcement agencies, intelligence agencies, and other government bodies to improve their ability to detect, prevent, and respond to threats (Mansur, 2019).

Effective use of ICT tools for combating insecurity in our higher institutions of learning such as CCTV systems and IEDs Detectors can be a great solution for the recent challenges of internal security issues, the tools can be used to execute some major issues of insecurity in the country at large.

Geographic Information Systems (GIS) in Security

GIS is a spatial data management tool used to capture, store, analyze, and display geographic information. For security, GIS enables, Crime mapping to identify high risk areas, Resource allocation based on spatial analysis, Emergency route planning and Incident trend analysis (Akinola, 2021).

Geographic Information Systems (GIS) provide spatial analysis and mapping capabilities that can help security managers detect patterns, monitor activities, and respond effectively to incidents. By visualizing crime data, mapping vulnerable areas, and optimizing patrol routes, GIS becomes a critical decision-making tool for campus safety management, (Adetoro and Ogunleye, 2019).

Security Challenges in Nigerian Tertiary Institutions

Security challenges in Nigerian tertiary institutions have intensified in recent years, ranging from theft, vandalism, cultism, sexual harassment, kidnapping, to violent clashes. These threats undermine not only the safety of students, staff, and property but also the overall quality of education.

Integration of ICT and GIS in improving internal security in Shehu Shagari College of Education

Shehu Shagari College of Education, Sokoto (SSCOE) is a leading teacher training institution in northwestern Nigeria. Like many tertiary institutions in the country, SSCOE faces internal security threats, including theft, cult-related activities, and intrusion by outsiders, sexual harassment, and vandalism of facilities. The adoption of Geographic Information Systems (GIS) offers a data driven, spatially informed approach to identifying, monitoring, and addressing these security challenges (Musa 2019).

The integration of Information and Communication Technology (ICT) and Geographic Information Systems (GIS) presents a proactive, technology driven approach to enhancing campus security. ICT enables real time communication, surveillance, and digital record keeping, while GIS offers spatial analysis and mapping to predict, monitor, and respond to security incidents effectively (Ajayi, and Oladipo, 2022).

Integration of ICT and GIS for Enhanced Security

The increasing incidence of internal security threats including theft, vandalism, cultism, sexual harassment, and intrusion has created an urgent need for proactive and technology-driven security systems in Nigerian tertiary institutions, these include not limited to the following.

1. **Smart Surveillance:** Linking CCTV cameras to GIS maps for real time spatial monitoring,
2. **Geo-Referenced Incident Reporting:** Each reported security case is automatically mapped.
3. **Drone Surveillance:** Using UAVs integrated with GIS for aerial monitoring of large campuses.
4. **Mobile Patrol Tracking:** Equipping security personnel with GPS-enabled devices connected to a GIS dashboard.
5. **Automated Alerts:** GIS-triggered notifications when unusual movement or crowding is detected.

Benefits of ICT and GIS Integration in Tertiary Institutions

According to Abdullahi and Suleiman (2020), there are several benefits that could be derived when there is effective integration of ICT and GIS in our institutions, these benefits are highlighted below:

1. Improved Situational Awareness

- Real-time monitoring of campus activities through ICT (CCTV, sensors) combined with GIS spatial visualization.
- Security managers can see the exact location of incidents on an interactive campus map.

2. Faster Incident Response

- GPS-enabled devices and GIS route mapping guide security personnel to incident locations quickly.
- ICT instant alerts (SMS, mobile apps) ensure rapid communication with response teams.

3. Data Driven Decision Making

- GIS crime hotspot mapping and ICT incident databases help identify patterns and predict potential threats.
- Enables evidence-based security policy formulation.

4. Optimal Resource Allocation

- GIS helps determine the best locations for patrols, checkpoints, and surveillance cameras.
- ICT tools track personnel deployment, ensuring effective coverage of high risk areas.

5. Enhanced Surveillance and Monitoring

i. CCTV networks linked to GIS maps show exact camera coverage and blind spots.

ii. Integration allows security teams to coordinate multiple monitoring points from a central control room.

6. Preventive Security Measures

i. Predictive analytics from GIS data can forecast potential high-risk events.

ii. ICT early-warning systems send alerts to students, staff, and security officers.

CONCLUSION

The fusion of ICT and GIS presents a strategic opportunity to address internal security concerns in Nigerian public tertiary institutions while simultaneously empowering students and staff with valuable digital skills. Shehu Shagari College of Education, Sokoto, can serve as a pilot institution, paving the way for a scalable model nationwide. Investing in this dual-purpose approach fosters not only a safer learning environment but also a more technologically competent academic community.

RECOMMENDATIONS

1. Federal and state governments should fund ICT-GIS infrastructure in public colleges.
2. Establish an ICT/GIS unit in every tertiary institution.
3. Incorporate digital security modules in teacher education curricula.
4. Partner with tech firms and NGOs for skills development workshops.
5. Create student led security innovation hubs.

REFERENCES

Abdullahi, A., and Suleiman, Y. (2020): Insecurity and its impact on education in Northern Nigeria. *Journal of African Development Studies, 15(2), 125– 138.*

Adeoye, B. A., and Aluko, A. O. (2021): Insecurity and educational development in Nigeria: A critical appraisal. *International Journal of Education and Social Science Research, 4(5), 45–55*.

Adetoro, R. A., and Ogunleye, T. A. (2019): GIS applications in educational infrastructure development in Nigeria. *Nigerian Journal of Geospatial Intelligence, 6(1), 67–79.*

Ahmed, S. (2020). The rise of banditry and kidnapping in Nigeria: Causes and implications. *African Security Review, 29(3), 215–228.*https://doi.org/10.1080/10246029.2020.1742870

Ajayi, O., and Oladipo, B. (2022): Spatial analysis of security threats and school development in rural Nigeria using GIS. *African Journal of Geo-Information, 11(1), 89–102.*

Akinola, R. O. (2021): Geospatial technology and security mapping in Nigeria. *International Journal of Remote Sensing and GIS, 14(3), 199–210.*

Ayuba, H., and Salihu, A. (2018). The impact of kidnapping on school attendance in selected Nigerian States. *Education and Conflict Journal, 10(2), 98–114.*

Ayuba B., Mugu, B.A., Tanko, H. and Bulus, S.J (2016). Geo-spatial analysis of crime in Kaduna Metropolis, Nigeria. *Science World Journal, 11(4): 7-15.*

Bassey, S. A., (2020): Technology, Environmental Sustainability and the Ethics of Anthropoholism. Przestrzeń Społeczna, 1(19).

Eimunjeze, L. and Ehikhamenle, J. (2025): GIS Analysis of Banditry and Kidnapping Effects on the Development of Selected Tertiary Institutions in Nigeria: Focus on NICTM Uromi, Edo State. *International Journal of Research Publication and Reviews, Vol 6, Issue 7, pp 3052-3055 July 2025 Journal homepage: www.ijrpr.com ISSN 2582-7421*

Mansur, Y. (2019), Closed Circuit Television (CCTV) and Crime Detection in Nigeria: A Conceptual Analysis, *A Journal of National Association of Criminology and Security Students, Federal University Dutse Chapter,*1(1).

Muhammad, M., Dangida, U. F., Mukhtar, J.I., and Muhammed, A.A. (2019): Electronic Surveillance as a regulatory Tool: Exploring the Role of CCTV in Nigerian Universities Libraries. *Dutse International Journal of Social and Economic Research, 1(1)154-163.*