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CPTED in Action: Designing A Strategic Campus Security Index For Safer Universities

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Abstract

Campus security issues in higher educational institutions are becoming more critical due to escalating threats and the absence of standardised, theory-based assessment tools. In Malaysia, this gap limits the systematic evaluation of campus safety. This study aims to develop a campus security index grounded in Crime Prevention Through Environmental Design (CPTED) and tailored to Malaysian public universities. Using a qualitative approach, focus group discussions (FGD) were conducted with academic staff, non-academic staff, and student representatives. Thematic analysis identified key indicators reflecting physical security conditions and safety perceptions, which were mapped onto the five CPTED domains. Expert reviews further validated the index and ensured structural consistency. The resulting tool offers a practical framework for benchmarking and enhancing campus security. The study contributes by providing a structured, context-specific, and empirically informed index, with recommendations for future quantitative validation and broader institutional application.

Keywords: Campus Security, CPTED, Index, Public University

Introduction

The global landscape of campus security has become increasingly challenging, reflecting a convergence of factors that exacerbate risks and create an environment detrimental to the safety of students and staff. Globally, the alarming frequency of violent incidents, such as mass shootings and acts of terrorism within educational institutions, serves as a reminder that the traditional perception of campuses as secure havens for learning has been fundamentally altered (Fisher & Smith, 2009; Tin et al., 2022). However, Malaysia exhibits similar trends. Investigations show that the moral panic about youth crime, bullying, and cyberbullying is making colleges and universities rethink their security measures and mental health support systems (Li, 2023). In particular, the rapid increase in the student population, accompanied by diverse backgrounds and psychological profiles, complicates the landscape (Musienko et al., 2022). Efforts directed towards constructing effective safety education

mechanisms that resonate with the contemporary psychological characteristics of students indicate an understanding of these multilayered issues (Li, 2023).

Globalisation, technological advances, and changing social norms present complex dynamics that campuses must navigate today. Institutions in Malaysia are increasingly adopting integrated security measures, including the implementation of digital platforms for incident reporting and the enhancement of surveillance systems with Closed-Circuit Television (CCTV) technology, which provides a proactive response to security challenges (Subramaniam, 2004). The establishment of strategic partnerships and dialogues at the regional level in Southeast Asia exemplifies a collaborative approach to tackling urgent security issues, illustrating the importance of a unified policy framework in educational contexts (Musienko et al., 2022). This multifaceted crisis, exacerbated by the recent COVID-19 pandemic, has further complicated universities' ability to maintain a secure learning environment (Tuga et al., 2022; Khymynets & Holovka, 2024). Thus, universities face not only physical security threats but also the challenge of ensuring mental well-being amidst pervasive uncertainty regarding health and safety.

A significant aspect of this gap is the absence of a universally accepted campus security index, which fundamentally hinders institutions' ability to effectively assess and improve their safety protocols. Without a coherent framework for measuring safety, universities often develop independent and arbitrary security measures that may not align with the best practices recognised in the broader educational ecosystem (Sharma & Radhika, 2023; Cozen & Sun, 2019). This inconsistency can lead to substantial disparities in perceived safety and actual security across campuses, which may adversely impact student enrolment and retention (Cozen & Sun, 2019). Furthermore, the lack of a standard CPTED framework hinders the potential benefits of incorporating these principles into campus security strategies and hampers standardised evaluations of their effectiveness (Stupar & Stupar, 2024; Park, 2010).

The significance of a well-designed campus environment is crucial for enhancing safety and security within educational institutions. Crime Prevention Through Environmental Design (CPTED) serves as a foundational framework addressing the relationship between the built environment and the opportunities for crime. This approach emphasises the strategic design of physical spaces to minimise criminal behaviour by offering a proactive, rather than reactive, stance on campus security (Mihinjac & Saville, 2019; Cozens & Love, 2015). The principles of CPTED, including natural surveillance, access control, and territorial reinforcement, help create environments that deter crime and promote trust and well-being among students and staff (Cozens & Linde, 2015; Cozens & Sun, 2019).

To address this gap, the goal of the current study is to create a Strategic Campus Security Index based on CPTED principles. This index aims to provide a standard tool for universities to assess and enhance their security measures quantitatively. By combining different CPTED strategies into this index, a university can obtain a full picture of how well their security works and compare results across campuses. The result sets a standard for ongoing improvement (Polin et al., 2024).

Moreover, this initiative contributes to innovation and sustainability within university ecosystems. By harnessing CPTED principles, universities can create secure and sustainable

environments that align with contemporary educational objectives. Such an approach illustrates the value of holistic planning, where safety is intertwined with environmental sustainability and user engagement (Mann et al., 2021; Almashhour & Samara, 2022). The resulting campus security index will serve as a benchmark for institutions that aim to optimise their safety protocols while promoting responsible environmental stewardship and a thriving academic climate. Through innovative practices rooted in CPTED, universities can enhance their attractiveness to prospective students and foster a more integrated and secure educational community. By conducting a focus group discussion (FGD) at four public universities in Malaysia, this study seeks to answer the following question:

1. How can CPTED principles be used to develop a campus security index for universities?
2. What key indicators are essential for assessing campus security based on CPTED domains?
3. How effective is the developed index as a tool for improving campus security management?

Literature Review

Campus Security Challenges in Higher Education

The increasing complexity of campus security challenges in higher education has highlighted several critical areas of concern, including rising crime rates, perceptions of safety, and environmental risks. Studies demonstrate trends indicating a significant incidence of various crimes on college campuses, with sexual assault and violent crimes frequently reported as major concerns (Backman et al., 2020; Follingstad et al., 2020). The 2020 “Campus Sexual Assault Policy and Prevention Initiative” found that while federal policies have been instituted to address these issues, their execution and effectiveness often fall short of expectations (Backman et al., 2020). Furthermore, the Clery Act mandates institutions to disclose crime statistics, yet many students remain inadequately informed about safety measures and perceptions of risk, which can exacerbate feelings of vulnerability within university environments (Palmer & Alda, 2016; Janosik & Gehring, 2003).

Environmental risks also play a big role in how people on campus feel about safety. Research indicates that specific environmental design features, such as inadequate lighting and lack of surveillance, can contribute to heightened fear among students (Sharma & Radhika, 2023; Park, 2010). The integration of Crime Prevention Through Environmental Design (CPTED) strategies has emerged as a framework aimed at mitigating these risks by enhancing visibility and control within campus spaces (Cozens & Love, 2015; Cozens & Sun, 2019). However, many institutions have yet to implement these approaches effectively, resulting in continued safety concerns and calls for comprehensive assessments (Backman et al., 2020).

Then, perceptions of safety on campus are inherently linked to student well-being and academic performance. Evidence indicates that a perceived lack of safety can adversely affect students' mental health and overall academic performance, resulting in diminished engagement in campus life and learning (Almashhour & Samara, 2022; Schafer et al., 2016). The recognition of these impacts is crucial as higher education institutions navigate the dual pressures of maintaining a safe learning environment and upholding their institutional reputations (Abubakar et al., 2016). Moreover, poorly managed safety concerns can tarnish a university's image, discouraging prospective students and undermining alumni relations (Evenson et al., 2012; Chua & Ahmad, 2021).

In conclusion, the intersection of crime trends, environmental risks, and safety perceptions in campus security illustrates the critical need for universities to adopt comprehensive strategies that address both physical and psychological aspects of safety. Institutions must prioritise implementing effective security measures grounded in CPTED principles while fostering an environment that promotes student well-being and academic excellence. By proactively addressing these challenges, universities can enhance their security frameworks and improve their institutional reputations, ultimately contributing to a safer and more sustainable educational ecosystem.

Crime Prevention Through Environmental Design (CPTED)

Crime Prevention Through Environmental Design (CPTED) is a systematic approach to prevention that emphasises the role of the built environment in reducing opportunities for crime. The concept was first articulated by C. Ray Jeffery in the 1970s, who proposed that the physical design of environments could influence criminal behaviour (Mihinjac & Saville, 2019; Cozen & Love, 2015). Over time, this basic idea has grown to include different psychological, sociological, and architectural points of view. This has made "defensible space" and the ability of people to interact with their environments more important (Mihinjac & Saville, 2019; Sypion-Dutkowska, 2023). CPTED is becoming more important in many areas, such as homes, parks, and schools. This shows that it can be used in many different ways to make communities safer (Mihinjac & Saville, 2019; Reynald, 2010).

CPTED is generally divided into three generations, each contributing distinct strategies aimed at crime reduction. First-generation CPTED is the initial framework focused on passive measures such as natural surveillance and territoriality, aiming to enhance visibility and ownership of spaces to deter crime. For instance, well-lit areas and unobstructed sightlines encourage visibility, reducing the likelihood of criminal activities Cozens & Love, 2015; Mihinjac & Saville, 2019).

Second-Generation CPTED: This stage expanded the original concepts to include more active strategies, such as access control and maintenance of natural surveillance. Tools such as fencing, signage, and active deterrents (e.g., security patrols) were incorporated (Mihinjac & Saville, 2019; Alhusban & Alhusban, 2020). This classification acknowledges the psychological aspects of security, emphasising that environmental design can deter criminal behaviour and positively influence users' perceived safety (Cozens et al., 2005; Lamoreaux & Sulkowski, 2019).

Third-Generation CPTED: The current evolution incorporates technology and community participation into the CPTED framework, emphasising a dynamic approach wherein institutions engage users in creating and maintaining safe environments (Mihinjac & Saville, 2019; Lamoreaux & Sulkowski, 2019; Son et al., 2024). This generation recognises the importance of user feedback and interdisciplinary approaches in designing secure environments, ensuring that strategies remain relevant and effective (Mihinjac & Saville, 2019; Sharma & Radhika, 2023).

In higher education, the application of CPTED principles has shown significant potential for fostering sustainable campus environments. By integrating CPTED strategies into campus planning, institutions can enhance safety while promoting environmental sustainability.

Sustainable design elements such as green spaces, native landscaping, and eco-friendly materials can coexist with CPTED strategies like natural surveillance and accessibility, creating a harmonious environment for learning and community engagement (Mihinjac & Saville, 2019; Wesenberg et al., 2024; Cozens & Sun, 2019). Research shows that places built with CPTED principles not only lower crime rates, but they also make students feel better mentally and socially (Alhusban & Alhusban, 2020; Cozens & Love, 2015).

Moreover, the implementation of CPTED on university campuses can improve institutional reputation, as a secure environment promotes student retention and attracts prospective students (Cozens et al., 2005; Zhao et al., 2023; Lynch et al., 2024). The alignment of CPTED with sustainability initiatives can also bolster university engagement with broader cultural and environmental goals, creating an interconnected approach to campus safety and sustainability (Sypion-Dutkowska, 2023; Kajalo & Lindblom, 2015).

In conclusion, CPTED represents a critical framework for addressing crime prevention within educational settings. Its evolution across generations reflects an increasing awareness of the interplay between design, community engagement, and crime reduction. The relevance of CPTED extends to sustainable campus environments, where integrating safety with design can yield considerable benefits in enhancing security and fostering a positive institutional reputation.

Gaps in Current Security Audit Frameworks

A significant shortcoming of current security audit frameworks is their rigidity and generalisations, which often fail to accommodate the unique contexts and diverse environments of higher educational institutions. According to Ismail et al. (2023), existing frameworks frequently overlook specific cultural, social, and physical characteristics pertinent to Malaysian universities, resulting in the ineffective application of standardised security measures. This challenges the effectiveness of audits, as assessments that do not take into account local variations may inadequately identify the types of risks that university campuses face.

Furthermore, the generalisation of international audit tools fails to address nuanced differences in security needs across various global regions. While frameworks such as the Consolidated Framework for Implementation Research could potentially inform understanding of barriers and facilitators to implementation in various contexts (Shelton et al., 2023), their application across different settings often presents barriers related to acceptability and feasibility. This limitation underlines a growing consensus that audit tools must be tailored to align with local circumstances and student populations, thereby ensuring their relevance and effectiveness (Sepadi & Chadyiwa, 2025).

Linking CPTED to Sustainable Campus Ecosystems

The enhancement of campus safety through CPTED principles is closely linked to promoting innovation and ecological development. Campuses that prioritise safety through effective design can foster a more vibrant academic environment by encouraging collaboration, social interaction, and creative problem-solving among students (Lamoreaux & Sulkowski, 2020). A study by Lamoreaux and Sulkowski underscores the balance between safety and psychological comfort, suggesting that campuses designed with CPTED measures not only

deter criminal activities but also cultivate welcoming spaces that enhance student participation in academic and extracurricular activities (Lamoreaux & Sulkowski, 2020). As such, safe campuses promote holistic development and support institutional missions aimed at advancing educational outcomes.

Moreover, CPTED strategies have shown potential for community engagement, essential for building resilience within campus ecosystems. As highlighted by Kim et al., community involvement in crime prevention initiatives, as facilitated by CPTED projects, can lead to effective response mechanisms against social problems, thereby contributing to a resilient campus community (Kim et al., 2019). Active participation from students, faculty, and local residents encourages a sense of ownership over the campus environment, which aligns with the broader goals of sustainable urban ecosystems. This collaboration allows institutions to leverage local assets, generating innovative ideas that can address both safety and environmental sustainability (Putri et al., 2021).

Furthermore, as noted in research by Davey and Wootton, effective urban design can integrate crime prevention strategies with eco-friendly practices, thereby resulting in spaces that support both environmental health and campus security (Davey & Wootton, 2016). The link between CPTED and sustainability is also evident in the development of third-generation CPTED, which advocates for a holistic approach that encompasses socio-environmental factors in crime prevention strategies (Mihinjac & Saville, 2019). This evolution emphasises the importance of adapting CPTED principles to contemporary challenges while recognising that long-term sustainability in campus design demands an interdisciplinary perspective.

Lastly, the theoretical grounding of CPTED, as presented by Ekblom, outlines critical synergies between crime prevention and environmental design (Ekblom, 2010). For universities committed to fostering safer and more sustainable ecosystems, the integration of CPTED principles can serve as a foundational framework for ongoing development. By embedding these strategies into campus planning policies and practices, universities can foster environments that are not only safe but also conducive to innovation, learning, and community cohesion.

Methodology

Research Design

The qualitative exploratory research design is particularly well-suited for investigating complex social phenomena, allowing for a more profound understanding of participants' perspectives and experiences. Focus Group Discussions (FGDs), a common methodology within qualitative research, facilitate the exploration of shared beliefs, behaviours, and attitudes among participants (Lamoreaux & Sulkowski, 2019). This approach involves gathering individuals from similar backgrounds to engage in guided discussions, providing insights that might not emerge through individual interviews or surveys (Menon & Suresh, 2020).

The iterative nature of qualitative research through FGDs allows for refining and adapting research questions based on participants' responses. This aligns with the findings of Cozens et al. (2022), who advocate for conducting iterative processes to enhance CPTED audits based on stakeholder feedback (Cozens et al., 2022). These iterative efforts illustrate the

value of integrating qualitative data in comprehensive risk assessments and audits to inform ongoing design improvements.

Sampling and Participants

Employing a diverse participant pool involving academic staff, non-academic staff, safety officers, and student leaders enriches the qualitative data collected during FGDs. Cheta-Maclean and Ololube (2025) emphasise that engaging diverse stakeholders facilitates a thorough examination of perceptions concerning institutional character and integrity, which are essential in university environments. Engaging a mix of academic and non-academic staff, alongside student representatives, helps ensure that multiple perspectives are considered, providing a more holistic view of the issues under investigation.

Each FGD was guided by a semi-structured protocol aligned with CPTED domains such as surveillance, territoriality, access control, and maintenance. The sessions were transcribed verbatim and anonymised to protect participant confidentiality. Four FGDs were conducted with 8 to 10 participants per group. Data collection continued until thematic saturation was achieved, that is, no new insights or themes emerged from the discussions. The demographic details of the FGD participants during the four sessions are compiled in Table 3.1.

Table 1
FGD Participant Demographics

FGD Group	Type of Institution	Participant Role	No. of Participants	Location
A	Research University	Staff (academic & non-academic)	17	Johor
		Student (local & international)	15	
B	Research University	Staff (academic & non-academic)	18	Pulau Pinang
		Student (local & international)	20	
C	Comprehensive University	Staff (academic & non-academic)	13	Sabah
		Student (local & international)	23	
D	Focused University	Staff (academic & non-academic)	14	Terengganu
		Student (local)	10	

Table 1 presents the demographic summary of participants involved in the Focus Group Discussions (FGDs). Four FGDs were held at public universities in Johor, Pulau Pinang, Sabah, and Terengganu. The sample comprised two research universities, one comprehensive university, and one focused university, ensuring representation of different institutional categories within Malaysia. Each focus group included students, both local and international,

as well as academic and non-academic staff. There were between 13 and 23 people in each group. This diverse composition was strategically selected to capture varied perspectives shaped by institutional structure, campus environment, and user experience. The inclusion of multiple geographic regions further strengthens the credibility, representativeness, and potential applicability of the findings across Malaysian public universities.

Data Analysis

The bar chart below shows the overall perception of campus safety at four public universities in Malaysia (designated A, B, C, and D). It is based on four main categories of security services. Focus Group Discussions (FGDs) with campus stakeholders, such as staff and students, produced the data.

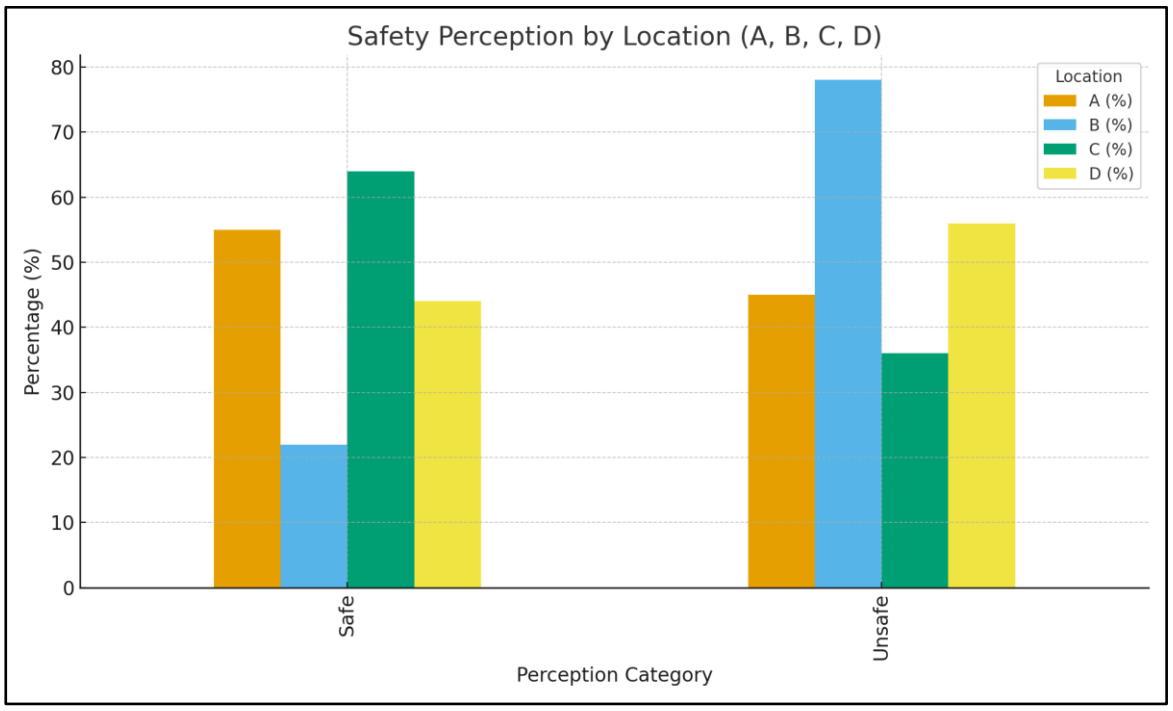

Figure 1: Data Analysis for Perception Campus Security

Most respondents have a moderately positive opinion of campus security services, as evidenced by the fact that, across all categories, the number of respondents who believe the campus to be safe generally outnumbers those who think it to be unsafe. However, significant differences between safe and unsafe across categories point to problem areas that need focused attention.

Based on the graph, the perception of safety varies noticeably across the four campuses (A, B, C, and D). Campus C shows the highest sense of safety, with 64% of respondents reporting feeling safe, followed by Campus A at 55%. In contrast, Campus B records the lowest level of perceived safety, where only 22% feel safe while a significant 78% feel unsafe. Campus D presents a more balanced perception, with 44% feeling safe and 56% feeling unsafe. Overall, the findings indicate that safety perception is not uniform across institutions, highlighting the need for targeted security improvements, particularly in Campuses B and D, where feelings of unsafety are comparatively higher.

Ethical Consideration

The institutional research ethics committee granted ethical approval for this study prior to data collection. All participants provided written informed consent and were briefed on confidentiality, anonymity, and the voluntary nature of their involvement. The data were securely stored and accessed only for research purposes. Participants were also informed that they could withdraw from the study at any time without penalty or negative consequences.

Results

Table 2 shows this study identified a set of campus security indicators structured under five key components: management, patrol, control, traffic, and special tasks from the literature review. Management indicators prioritise personnel training, security policies, and incident documentation to ensure administrative readiness. Patrol covers campus police presence, frequency of patrols, and routine security checks, which influence users' sense of safety. Control involves the availability of security personnel, the presence of guards, and the implementation of physical barriers to restrict unauthorised access. Traffic indicators highlight the importance of signage, safety warnings, smooth traffic flow, and surveillance vehicles for campus mobility and response efficiency. Special tasks incorporate intelligent access systems, integrated surveillance, emergency drills, disabled-friendly facilities, and construction barricades, reflecting proactive measures for safer campus environments. Together, these indicators form a comprehensive framework for evaluating security conditions across institutions.

Table 2
Previous Study on Campus Security

Component	Items	Description	Author(s)
Management	Personnel training & SOPs	Ensures security personnel are well-prepared and operate under standardised procedures.	Ekpoh et al. (2020); Dlamini (2021)
	Security assessments & policies	Covers vulnerability assessments and establishment of campus security policy frameworks.	Muraya et al. (2020); Simpeh & Adisa (2020)
	Record keeping & vandalism policy	Maintains incident records and implements regulations to control misconduct and vandalism.	Simpeh & Adisa (2020); Ekpoh et al. (2020)
Patrol	Campus police patrols	Continuous patrolling enhances presence, surveillance visibility, and crime deterrence.	Braaten et al. (2020)
	Absence of patrols	Lack of patrol activities contributes to increased vulnerability among campus users.	Lekganyane et al. (2023)

	Security checks	Routine checks are performed to maintain safety and monitor high-risk zones.	Simpeh & Adisa (2020)
Control	Approachability & promptness	Campus police or security personnel should be available and respond quickly.	Braaten et al. (2020)
	Security guard presence	Security staff are stationed at key access points across the campus.	Simpeh & Adisa (2020)
	Physical barriers	Gates, fencing, and restricted access infrastructure should be applied to control entry.	Muraya et al. (2020)
Traffic	Traffic signage	They guide pedestrian and vehicular movement to ensure safe circulation on campus.	Braaten et al. (2020)
	Safety warning signs	Alerts users to hazardous or restricted areas.	Peng (2024)
	Well-organised traffic flow	This system minimises congestion, thereby increasing accessibility and emergency response times.	Huang et al. (2022)
	Surveillance vehicles	The surveillance vehicles are designed to provide mobile monitoring and rapid response capability.	Ekpoh et al. (2020)
Special Tasks	Intelligent access systems	These systems automate access control through the use of innovative technologies.	Moghayed et al. (2024); Simpeh & Adisa (2020)
	Surveillance integration	Centralised or advanced surveillance systems for enhanced monitoring.	Ekpoh et al. (2020)
	Fire & emergency drills	Safety training focused on crisis preparedness and evacuation.	Muraya et al. (2020)
	Disabled-friendly facilities	Ramps, lifts, and accessible restrooms are examples of inclusive designs.	Simpeh & Adisa (2020)
	Construction barricades	Protective barriers are used around active construction zones for public safety.	Huang et al. (2022)

Mapping of CPTED and Current Component

Table 2 shows a methodical mapping of the current security practices determined by fieldwork and focus group discussions with the fundamental ideas of Crime Prevention Through Environmental Design (CPTED). The mapping shows a thorough alignment between theoretical concepts and practical tactics across the five CPTED indicators, which are natural surveillance, natural access control, territorial reinforcement, maintenance, and social management.

Regular patrol operations, such as campus police presence and security checks, operationalise natural surveillance by increasing informal observation, improving visibility, and discouraging potential criminal activity. The control component oversees natural access control, which includes the deployment of guards, checkpoints, and physical barriers to control movement and safeguard restricted areas. Territorial reinforcement combines patrol and traffic control procedures with road structures, fencing, and conspicuous signage that deters illegal use and communicates space ownership.

The university's management practices, such as applying Standard Operating Procedures (SOPs), routine facility maintenance, and enforcing anti-vandalism policies, all demonstrate the maintenance component. These actions lessen the possibility of disorder by reflecting an actively maintained environment. Finally, the special task domain incorporates social management derived from third-generation CPTED. This procedure includes accessible facilities, community engagement initiatives, and inclusive emergency drills. These programmes help the campus community develop resilience and a sense of shared responsibility.

The Campus Security Index (CSI) structure is generally validated by this mapping as being both theoretically sound and practically implementable, guaranteeing that a combination of stakeholder engagement, policy enforcement, and environmental design addresses the aspects of campus security.

Table 3
Mapping of CPTED and Current Component

CPTED	Indicator	Items	Description
Natural Surveillance	Patrol	Campus police patrols, routine security checks	The system enhances visibility and deters potential offenders through frequent security presence and monitoring activities.
Natural Access Control	Control	Security checkpoints, guard presence, physical barriers	Regulates access points to minimise unauthorised entry and direct movement into secure areas.
Territorial Reinforcement	Traffic & Patrol	Road and security signage, perimeter fencing, patrol visibility	Clear physical boundaries are established to reinforce ownership, responsibility, and proper use of campus spaces.
Maintenance	Management	SOPs, facility upkeep, vandalism control policies	The management team continuously maintains the infrastructure and implements security policies to prevent disorder and crime.
Social Management	Special Tasks	Emergency drills, inclusive facilities, communication systems	Community engagement, awareness initiatives, and well-prepared emergency response mechanisms strengthen the safety culture.

Table 3 presents the mapping of the identified campus security indicators to the five CPTED principles, demonstrating how each element contributes to a safer university environment. First, it reflects the natural surveillance principle, which is implemented through patrol components, including campus police patrols and routine security checks. This element enhances visibility on campus grounds, enabling the early detection of suspicious behaviour while deterring potential offenders through the constant presence of security personnel.

Next, it highlights the natural access control principle under the control component, including security checkpoints, guard deployment at key access points, and the establishment of physical barriers. These measures function to regulate movement by controlling entry and exit, thereby minimising unauthorised access and ensuring that circulation flows through designated monitored pathways.

Furthermore, it demonstrates territorial reinforcement, supported through traffic and patrol management. The indicators, such as road signage, security signposting, fencing, and visible patrol units, shape both symbolic and physical boundaries that convey ownership over campus areas. This fosters responsible spatial use, enhances user awareness, and reinforces psychological deterrence by signalling a defined territory.

Besides that, it is grounded in the maintenance principle, represented by management components such as standard operating procedures (SOPs), facility maintenance, and vandalism policies. Well-maintained environments reflect active oversight and institutional care, discouraging disorder while supporting perceptions of safety. Preventive upkeep and responsive maintenance reduce opportunities for crime linked to neglect or deterioration.

Lastly, integrated social management is the 3rd Generation CPTED through special task components, including emergency drills, inclusive facilities, and communication systems. These elements emphasise preparedness, community engagement, and inclusivity; they promote safety awareness among campus users. By enhancing resilience and cooperation, this domain strengthens social cohesion, supports equitable access, and contributes to a holistic, community-driven approach to campus security.

Discussion

The mapping of findings to CPTED principles demonstrates how campus security measures identified in the qualitative data align with established theoretical constructs. Campus police patrols and security checks enhance visibility and establish a sense of constant monitoring, reflecting the first indicator, natural surveillance. This finding corresponds with CPTED literature, which highlights surveillance as a key deterrent to crime by increasing the likelihood of detection (Cozens & Love, 2015). The presence of patrolling personnel in the data reinforces prior studies suggesting that visible guardianship reduces fear and discourages misconduct among campus users.

The second indicator, natural access control, aligns with the use of security checkpoints, guard presence, and physical barriers. This mirrors CPTED's recommendation that controlling entry points can reduce unauthorised access and strengthen perimeter security (Armitage, 2018). The qualitative insights support this view, particularly through the participants' references to controlled gate access and barrier systems, suggesting that access management plays a central role in minimising intrusion risks.

For territorial reinforcement, the data highlight signage, fencing, and patrol visibility as mechanisms that define ownership and guide responsible space use. This resonates with literature asserting that symbolic markers and territorial cues communicate boundaries and promote rule compliance (Crowe & Zahm, 2020). The findings indicate that physical demarcation and visible territorial claims can psychologically influence behaviour by positioning territorial reinforcement as both a preventive and a regulatory mechanism within campus environments.

The fourth indicator, Maintenance, emphasises SOPs, facility upkeep, and vandalism policies, reflecting the importance of cleanliness and management efficiency. Existing literature stresses that poorly maintained environments signal neglect and invite deviant behaviour, whereas well-maintained spaces project control and guardianship (Keiser et al., 2008). The study's findings reinforce this perspective, revealing that maintenance is not simply operational but a security strategy that maintains order and reduces disorder-related crime.

Lastly, social management, which is part of third-generation CPTED, includes emergency drills, facilities that everyone can use, and communication systems that encourage people

to get involved in their communities. Scholars note that contemporary CPTED extends beyond physical design to incorporate social cohesion and preparedness (Mihinjac & Saville, 2020), a theme strongly reflected in the data. The study shows that participation in campus communities, inclusive infrastructure, and safety awareness programmes fosters shared responsibility, resilience, and equitable protection for all campus users.

The findings reaffirm the relevance of CPTED as a guiding theoretical framework and highlight the necessity for a comprehensive Campus Security Index (CSI) that integrates environmental design elements with community perceptions. The proposed CSI has strong potential as a standard assessment tool, enabling universities and policymakers to benchmark performance, monitor risk indicators, and drive continuous improvements in campus safety management.

Conclusion

To tackle growing security worries in Malaysian public universities, this study presents a Strategic Campus Security Index (CSI) based on Crime Prevention Through Environmental Design (CPTED). Using a qualitative exploratory design involving focus group discussions, five key elements, such as management, patrolling, control, traffic, and special tasks, were identified as central to shaping both perceived and actual campus safety. These components were systematically mapped to CPTED principles, confirming the theoretical relevance and contextual suitability of the proposed index. The CSI advances the literature by translating CPTED concepts into a structured, context-sensitive, and empirically developed auditing instrument tailored to Southeast Asian campuses, offering an improvement over existing audits that often lack theoretical grounding or cultural alignment. Designed as a governance and planning tool, the index enables data-driven decision-making, performance benchmarking, and continuous enhancement of campus resilience and inclusivity. Future research should focus on quantitative validation, adaptation across different institutional settings, and integration with emerging security technologies to enable dynamic and responsive safety management. This work, therefore, represents not only an innovative assessment framework but also a strategic shift toward theory-informed and stakeholder-driven campus security governance.

Limitations and Future Recommendations

Despite the valuable insights generated, this study has limitations. The participant sample was limited to several Malaysian public universities, which may not fully capture the diversity of campus layouts, governance systems, and institutional cultures nationwide. Therefore, although the findings provide valuable context, one should exercise caution when extrapolating them to other public, private, or community-based higher education institutions.

To enhance and broaden the study's contribution, several avenues for future research are proposed. Once the CPTED-based Campus Security Index (CSI) is complete, multiple universities should conduct a large-scale quantitative validation through survey deployment. This step will enable rigorous testing of the index’s reliability, internal consistency, and external validity, thereby strengthening its credibility as a benchmarking and decision-support tool for campus security management.

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