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Campus Planning and Design across Southeast Asia: A Scoping Literature Review from 2002-2022

Sabariah Mansor[1], Raziah Ahmad [2], Jamalunlaili Abdullah[1], Ardiyanto Maksimilianus Gai[3]
** Corresponding author*

[1] *College of Built Environment, Universiti Teknologi MARA (UiTM), 40450 Shah Alam, Selangor Malaysia*, [2] *School of Town Planning & Landscape Architecture, Universiti Teknologi MARA (UiTM), 42300 Puncak Alam, Selangor Malaysia*, [3] *Urban and Regional Planning Department, Malang National Institute of Technology, Bendungan Sigura-gura Street 2, Malang, 65145, Indonesia*

sabariah_mansor@yahoo.com, , razia841@uitm.edu.my, jamal858@uitm.edu.my, ardiyanto_maksimilianus@lecturer.itn.ac.id

Tel: +6019-7276846

Abstract
As Southeast Asia continues to experience rapid urbanization, ensuring sustainable development in higher education campuses is becoming increasingly crucial. This paper presents a systematic literature review of 52 relevant research articles from 2002-2022. By analyzing the existing literature, this study aims to explore key themes in campus and planning design across Southeast Asia while incorporating Sustainable Development Goals (SDGs) as contextualizing background. Findings suggest sustainable and inclusive campus as dominant themes which significant to promote student well-being and academic success while enhancing environmental responsibility in Southeast Asia's campus.

Keywords: higher education institutions; campus planning and design; Southeast Asia ; Sustainable Development Goals (SDGs)

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1.0 Introduction

The physical environment of a university campus plays a crucial role in shaping the overall student experience, supporting academic success, and promoting well-being (Grocer et al., 2018). Design elements such as visual connectivity, functionality, accessibility, comfort, seasonal strategy, and human-scale proportions of the spatial configuration have a significant impact on the area of motion and field of view, influencing user perceptions and preferences (Grocer et al., 2018). Experiences in these settings offer different levels of restoration likelihood and can significantly impact the overall quality of life of students (Gulwadi et al., 2019) and emphasizing on subjective parameters such as inter and intrapersonal values, emotional intelligence, and civic engagement is proven important when planning and designing spaces (Chrisinger & Rich, 2020). Moreover, campus spaces should enable knowledge and creativity hubs, and foster social well-being through a sense of place and community (Soares et al., 2020). While extensive research has been conducted in the West, previous literature pertaining higher education landscape in Southeast Asia is limited. Southeast Asia has emerged as a promising region in the global economy, with several countries becoming significant players (OECD, 2018). For the region to maintain this trajectory, it is vital to prioritize quality education to develop a skilled and competent workforce that can contribute to economic growth and sustainable development (United Nations, 2020). As such, investing in higher education and promoting the development of university campus that integrate sustainability principles is crucial for the region to continue to thrive in the global arena (Bong & Premaratne,

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2018). Therefore, this paper aims to explore the current themes in campus planning and design based on existing literature across Southeast Asian countries. By adapting the Sustainable Development Goals (SDG) framework as a narrative device to contextualize the study, the objective of this paper is to map the direction of key themes while providing an overview of best practices of incorporating SDG framework into campus planning and design.

2.0 Literature Review

2.1 The Context of Campus Planning and Design

In the context of sustainable development, universities in Southeast Asia can play a crucial role due to their unique position within diverse communities (Agusdinata, 2022). Campus environments can serve as building blocks towards sustainable development by prioritizing safety, inclusivity, and well-being while also promoting economic growth and minimizing adverse impacts on the environment (Alias et al., 2020; Agrawal & Yadav, 2021). However, previous research on campus environments in Southeast Asia has mainly focused on physical issues such as infrastructure, transportation, and safety (Tao et al., 2019; Jalalkamali & Ghraei, 2012; Setiawan et al., 2015; Abd Razak et al., 2011). In contrast, the social aspects of campus environments such as the provision of social spaces can contribute to social sustainability and foster a sense of community and attachment to the place (Matthiesen, 2009). To fully realize the potential of universities in Southeast Asia towards sustainable development, there needs to be a greater emphasis on incorporating social aspects into campus planning and design.

2.1 Sustainable Development Goals (SDGs)

With the 2030 Agenda for Sustainable Development deadline approaching, sustainable development remains a crucial focus of global policy and action (United Nations, 2020). To achieve sustainable development on campuses, it is essential to integrate the three pillars of sustainability: social, economic, and environmental sustainability, into campus planning and design (Alshuwaikhat & Abubakar, 2008). Based on Table 2.1, SDG 4 explicitly references education, and universities have a significant role in achieving SDGs (Mader & Rammel, 2015; Shiel & Cantarello, 2020). To realize this potential, campus planning and design should focus on SDGs 3, 4, 11, 13, and 15, with an emphasis on creating a campus environment that is safe, inclusive, and promotes well-being, while supporting long-term economic growth and minimizing negative environmental impacts (Alias et al., 2020; Agrawal & Yadav, 2021).

Table 2.1. Interpretation of SDGs within the context of campus planning and design

Sustainable Development Goals (SDGs) that related to campus planning and design	Interpretation based on campus planning and design context
Goal 3 : Good Health & Wellbeing	"Ensuring that students and educators have the support they need to maintain their health and well-being, campuses can provide recreational and social spaces, counselling centres and meditation areas"
Goal 4 : Quality Education	"Inclusive and equitable quality education for all students. Campuses may ensuring that their facilities, resources, and curriculum accommodate varied student populations regardless of socioeconomic status, ethnicity, or gender"
Goal 11 : Sustainable Cities & Communities	"Establishing urban spaces that are liveable and sustainable. Green spaces, bike lanes, and public transportation may be incorporated into campuses to promote sustainable transportation and minimise carbon emissions"
Goal 13 : Climate Action	"Adopt strategies to reduce greenhouse gas emissions, such as increasing the use of bicycles and electric vehicles, encouraging public transit, and cutting energy use in buildings"
Goal 15 : Life on Land	"Promote biodiversity by preserving natural ecosystems, implementing sustainable land-use policies, and pursuing reforestation initiative"

(Source: Author)

2.3 The 21st Century Educational Settings

A shift has occurred in the focus of university campus orientation from Newman's model of inward-looking single-use campuses to multifunctional living, learning, research, and teaching spaces (Agrawal et al., 2021). With the rapid growth of urban population and urbanization, university campuses are constantly evolving in response to changes in social, economic, and environmental factors, requiring campus planners and administrators to adapt to changing needs of students and staff (Ozkan et al., 2017). However, despite the significance of social spaces on university campuses, they are often overlooked during planning and design, resulting in short-term solutions that fail to address the campus's physical and socio-ecological capacity (Yerli & Ozdede, 2017; Li, 2019; Yaylali & Cil, 2019; Huang, 2020; Roggema, 2021), which contradicts the goals outlined in SDGs. To achieve a safe, inclusive campus environment that promotes well-being, supports long-term economic growth, and minimizes negative environmental impact, a deeper understanding of the role of social spaces in educational settings is needed (Alias et al., 2020; Agrawal & Yadav, 2021; Roggema, 2021). Social spaces on university campuses are characterized by their ability to facilitate social interaction, relaxation, recreation, idea exchange, and a sense of belonging and ownership. They are intended to provide opportunities for leisure that enhance physical and mental well-being, alleviate stress, and offer a pleasant atmosphere (Hertz et al., 2018). According to Ozkan et al. (2021), there is a strong correlation between human needs and the design principles of outdoor spaces, particularly in urban environments. Drawing on Maslow's hierarchy of needs, the concept of social spaces on university campuses is an interplay between the communal life of the campus that necessitates social interaction. The socialization activities among students and staff are critical for identity development and personality formation (Siramkaya & Aydin, 2014). Moreover, the COVID-19 pandemic and subsequent global lockdowns have highlighted the importance of

socialization and the negative impacts of self-isolation and the absence of social events on mental health (Marotta et al., 2021; Sun et al., 2021).

3.0 Methodology

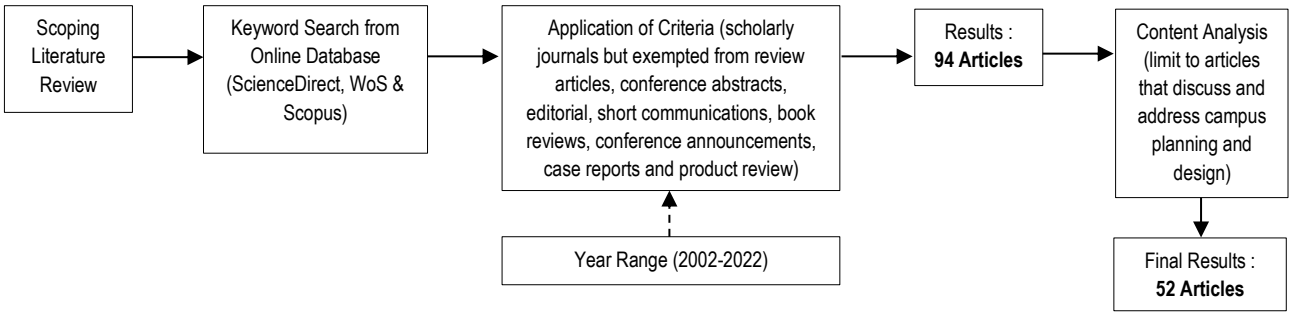

Fig. 3.0: Flow chart of methodology applied to this study
(Source Author:)

This study used scoping literature review to explore campus planning and design in Southeast Asia, identifying knowledge gaps and clarifying concepts through keyword-based analysis of relevant literature (Munn et al., 2018). Scoping reviews synthesize research evidence, map existing literature, and are often referred to as "mapping" reviews. (Peters et al., 2015). To start, this study developed keyword search terms such as 'campus', 'university', and 'colleges' related to 'planning and design', 'guidelines', and 'policy'. These search terms were applied to academic databases ScienceDirect, Web of Science, and Scopus, with the inclusion criteria limited to scholarly journals and open access articles, while excluding review articles, conference abstracts, editorials, short communications, book reviews, conference announcements, case reports, and product reviews. Any duplicated articles were removed, and a date filter of twenty years from 2002 to 2022 was applied. The resulting brief summaries of each topic were organized into a spreadsheet for analysis. The full article review was conducted in two phases. Firstly, only articles limited to eleven Southeast Asian countries were considered. Malaysia and Indonesia had the most publications discussing the dimensions of campus planning and design, while Brunei, Myanmar, Cambodia, Timor-Leste, and Laos had no previous studies published due to language barriers and publication restrictions. In comparison to Malaysia and Indonesia, the Philippines, Singapore, Thailand, and Vietnam had fewer publications. Secondly, previous studies that did not address or discuss campus planning and design was eliminated, resulting in a total of 52 articles for interpretative and descriptive perspective for thematic analysis.

Table 3.0. Articles that discuss about campus planning and design from online databases.

Countries in Southeast Asia	Number of Articles	Science Direct	Web of Science	Scopus
Brunei	0	0	0	0
Myanmar	0	0	0	0
Cambodia	0	0	0	0
Timur-Leste	0	0	0	0
Indonesia	18	10	4	4
Laos	0	0	0	0
Malaysia	51	34	5	12
Philippines	5	4	0	1
Singapore	7	5	1	1
Thailand	7	5	2	0
Vietnam	6	2	3	1
Total	**94**			

(Source: Author)

4.0 Findings

This paper analysed 52 articles related to campus planning and design in Southeast Asia using a thematic analysis approach. The findings showed that the physical environment of campus settings was the most addressed theme in the context of campus planning and design. Table 4.0 further elaborates on the different dimensions and aspects that have been covered in the previous studies, based on their areas of concerns and themes derived from that.

Table 4.0. Summary of themes derived from articles that discusses campus planning and design in Southeast Asia based on country

Country (Number of articles found in databases % N=52)	Author(s)	Area of concerns	Dimensions derived from research articles
Indonesia (25.00%)	Muwardi & Dewancker (2017)	Ideal pedestrian ways are crucial for a sustainable campus design.	Quality of Pedestrian Mobility
	Budihardjo et al. (2021)	Sustainable practices are needed in all aspects of university operations.	Decision Making Process
	Ramadhan et al. (2021)	Outdoor spaces support student activities and recreation.	Spatial Layout
	Yusuf & Fajri (2022)	Environmental education and waste management are important.	Decision Making Process
	Lavista et al. (2015)	Measuring the carbon stock of trees is crucial.	Ecological Significance
	Setiawan et al. (2015)	Sustainable transportation is needed for a better quality of life.	Transportation Design
	Andoko & Prastomo (2021)	Green campus promotes sustainability and solves local problems.	Spatial Layout
	Supriyadi R (2012)	Green spaces benefit physical and mental health and air quality.	Decision Making Process
	Susilowati et al. (2021)	Holistic approach to campus management integrates social, environmental, and economic sustainability.	Ecological Significance
	Putri et al. (2020)	Sustainable practices are needed in all aspects of university operations.	Outdoor Environment
	Prafitasiswi et al. (2022)	Green building saves resources and follows ecological principles across its life cycle.	Decision Making Process
	Giantari et al. (2022)	Quality services and facilities can affect stakeholder satisfaction in universities.	Service Quality - Buildings & Facilities
	Fatriansyah et al. (2021)	A green campus can serve as a model for sustainable behavior and enhance the learning experience.	Decision Making Process
	Hooi et al. (2012)	Distance learning can reduce energy consumption and waste generated by universities.	Decision Making Process
	Jalalkamali & Ghraei (2012)	Cycling in campus can reduce air pollution, traffic congestion, and parking demand.	Transportation Design
	Khalil et al. (2011)	Higher education institutions should improve air quality, temperature and humidity levels, noise levels, and lighting for a comfortable and healthy indoor environment.	Decision Making Process
	Abdullah et al. (2011)	Campus design affects student lifestyle and learning; it should promote sustainability, social interaction, and well-being.	Outdoor Environment
Malaysia (55.76%)	Hashim et al. (2013)	Malaysian universities prioritize sustainable transportation and campus greening, including efficient bus services.	Transportation Service Quality
	Osman et al. (2014)	Educational institutions must provide barrier-free facilities for people with disabilities to ensure equal participation.	Disability Accessibility
	Khalil et al. (2014)	Prioritizing building performance and sustainability in higher education institutions is crucial for creating a functional learning environment	Decision Making Process
	Abd-Razak et al. (2011)	Designing campuses with accessibility, safety, and social interaction in mind improves student quality of life and overall school success.	Spatial Layout
	Sedaghatnia et al. (2015)	Universities prioritize creating a sense of community through programs that support student engagement, wellness, social interaction, and cultural exchange.	Psycho-Social Environment

	Hashim & Denan (2015)	Access to green spaces in learning environments has a positive impact on student well-being, academic performance, and creativity, reducing stress and anxiety.	Outdoor Environment
	Ibrahim & Fadzil (2013)	Innovative and creative learning environments are needed to satisfy students' desire for individuality and identity.	Interior Environment
	Applasamy et al. (2014)	An ideal learning environment considers the emotional and psychological well-being of students and instructors.	Psycho-Social Environment
	Muslim et al. (2012)	Student housing can contribute to students' academic and personal development.	Living Quality
	Yuserrie et al. (2015)	Encouraging walking to university can create a sense of community and reduce traffic congestion.	Quality of Pedestrian Mobility
	Din et al. (2015)	Social learning spaces play a significant role in learning and future educational planning.	Psycho-Social Environment
	Ramu et al. (2020	Social learning spaces can significantly impact learning and future educational planning through informal learning	Psycho-Social Environment
	Abdullah & Yusof (2012)	Lack of structured planning may result in campus development that does not align with the university's goals and objectives.	Decision Making Process
	Ishak et al. (2012)	Understanding the underlying causes of energy waste can promote sustainable energy use in higher education institutions.	Decision Making Process
	Sufar et al. (2010)	Libraries serve multiple roles within communities and society and should focus on user needs.	Interior Environment
	Derahim et al. (2011)	University staff plays a critical role in promoting sustainability efforts.	Decision Making Process
	Tahir et al. (2021)	Practical and meaningful learning environments enable learners to apply knowledge and skills to real-world challenges.	Decision Making Process
	Zaki et al. (2020)	Energy-efficient campus design saves money and promotes environmental responsibility.	Outdoor Thermal Comfort
	Chen et al. (2021)	Childhood experiences with built environment affect travel behaviour and environmental impact.	Transportation Design
	Yusof et al. (2016)	Integrating research and learning spaces creates flexible and dynamic campus learning environments.	Psycho-Social Environment
	Im et al. (2022)	VR and CGS technologies enhance education and inclusive campus environments.	Technological Accessibility
	Zaki & Ismail (2021)	Higher education institutions aim for inclusive environments, accommodating students with disabilities through accessible facilities, services, and programs.	Disability Accessibility
Philiphines (1.92 %)	Orbon et al. (2018)	Temperature, humidity, and air quality impact learners' health and learning, making thermal comfort and climate change crucial considerations.	Outdoor Environment
	Mehta et al. (2017)	Universities and research institutes tackle climate change, global health, and education opportunity, such as NTU.	Decision Making Process
Singapore (5.76 %)	Xavier & Alsagoff (2013)	Universities lead efforts in climate change, health, and education. NUS successfully became world-class in less than 20 years.	Decision Making Process

Thailand (5.76 %)	Tao et al. (2019)	Semi-outdoor spaces on campus affect ventilation but have been overlooked in literature.	Spatial Layout
	Hirunsalee et al. (2013)	Universities can serve as evacuation centers during natural disasters and support emergency response efforts.	Decision Making Process
	Aruninta et al. (2018)	Green campus planning includes landscape design and reducing energy consumption, especially for HVAC systems.	Outdoor Thermal Comfort
	Wattanapisit et al. (2016)	Studying physical activity and its factors among medical students can provide insights into their well-being and stressors.	Outdoor Environment
Vietnam (5.76 %)	Ngo & Trinh (2016)	The university-city complex model promotes collaboration between universities and their surrounding urban areas for development.	Decision Making Process
	Ramsbotham et al. (2019)	The learning environment affects nursing students' competence and achievement. A supportive environment enhances learning outcomes.	Service Quality - Buildings & Facilities
	Nguyen et al. (2022)	Smart-university campus includes smart buildings, grid, water and waste management, parking, and access control to improve learning environment and outcomes.	Technological Accessibility

(Source: Author)

5.0 Discussion

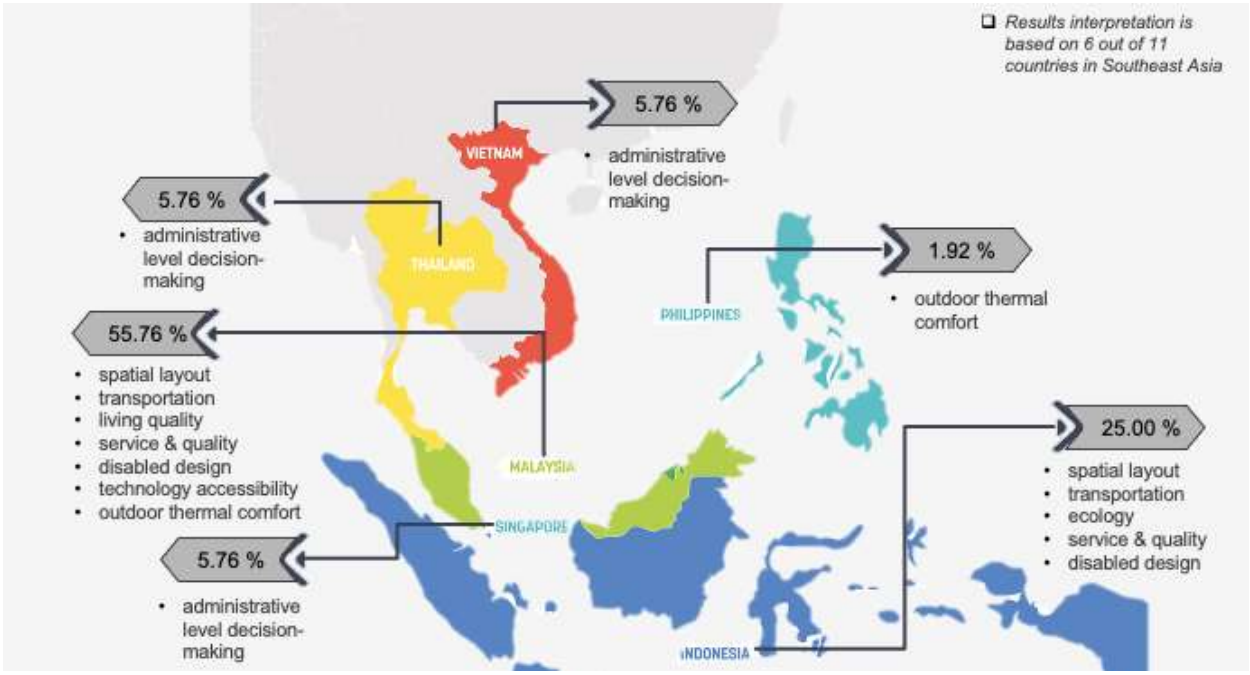

Figure 5.0 : Frequencies of literature based on empirical studies pertaining campus planning and design across Southeast Asia countries from year 2002 until 2022.

For countries such as Indonesia and Malaysia, the large number of literature found compared to other countries showed the dominance of studies being undertaken in regards to campus planning and design by mainly focusing on the creating sustainable and inclusive campus environments (Khalil et al., 2014; Fatriansyah et al., 2021) that incorporate natural elements is essential to promote student

well-being, academic success, and environmental responsibility (Abdullah et al., 2011: Mehta et al., 2017). A holistic decision-making process that considers the social, economic, and environmental impacts of campus activities should guide the design and management of campus facilities and operations showed to be the dominant theme for Singapore, Thailand, and Vietnam. The emphasis on creating sustainable and green campuses aligns with SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action) and SGD 15 (Life on Land) which aims to make cities and human settlements inclusive, safe, resilient, and sustainable (Aruninta et al., 2018; Budihardjo et al., 2021). This is supported by inclusive and supportive campus environments that prioritize accessibility, safety, and social interaction foster a sense of community and belonging, promoting student engagement and wellness (Hertz et al.,2018). Meanwhile, the design and management of outdoor spaces, including green areas and pedestrian ways, are essential components of a sustainable and natural campus environment (Alias et al., 2020; Agrawal & Yadav, 2021;Roggema, 2021). This aligns with SDG 3 (Good Health and Well-being), which aims to ensure healthy lives and promote well-being for all ages and designing inclusive and supportive campus environments aligns with SDG 4 (Quality Education). By prioritizing sustainable practices, inclusion, and exposure to nature, campuses can enhance the living quality and academic performance of their students while promoting environmental responsibility ecological significance adaptation and outdoor thermal comfort through leveraging on the tropical climate conditions (Aruninta et al., 2018: Orbon et al., 2018).

6.0 Conclusion& Recommendations

In conclusion, this study highlights the importance of sustainable and inclusive campus planning and design for promoting student well-being and academic success in Southeast Asia. Emphasizing sustainable practices can improve the living quality, academic performance, and environmental responsibility of campuses. However, there is a limitation on this study that should be noted is that while most Southeast Asian countries are still in the early stages of planning and designing university campuses due to their history of colonialism, the concept of campus planning and design is still emerging. Unfortunately, due to barriers such as economic conditions and language, there is limited documentation and comprehensive studies conducted on this topic, particularly for cross-border comparisons. This study was also limited by the absence of literature from other Southeast Asian countries, making it challenging to compare campus planning and design practices across the region. Therefore, future research should explore the various aspects of campus planning and design practices, with a focus on the relationship between these elements, to inform evidence-based decisions in the decision-making process for campus planning and design.

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Paper Contribution to Related Field of Study

By mapping the current trends in campus planning and design across several Southeast Asian countries, this paper contributes to the field of study by identifying the dominant themes that align with the SDGs. The paper highlights the significance of a holistic decision-making process that considers the social, economic, and environmental impacts of campus activities in guiding the design and management of campus facilities and operations.

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