Exploring the Preferences of Local and International Students for High-Rise Residential Green Building Features

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Abstract

This study explored the preference for green building features among local and international students in high-rise residential buildings. A lack of studies was identified regarding how regional and international students differed in their prioritization of green building features when choosing accommodations. Thus, this research aimed to examine preferences for green building features among students in high-rise buildings in Selangor, specifically focusing on Green Condominium in Shah Alam. A mixed-method approach was applied in this research. Firstly, an interview was conducted with the property manager to identify the green building features present in the case study. Secondly, a questionnaire survey was distributed to the respondents to analyse the green building features in high-rise residential buildings. Then the data was analyzed using descriptive analysis and the Relative Important Index (RII). The findings show that local students emphasize recycling and resource conservation. Meanwhile, international students prioritize water efficiency and healthier living environments. These findings revealed beneficial information to developers and policymakers to implement green features. Thereby, they can promote environmental sustainability while pleasing residents' satisfaction. Thus, based on these findings, this research suggests enhancing water efficiency features, investing in solar energy, encouraging recycling and resource conservation. Adopting these recommendations could significantly improve sustainability in high-rise residential buildings and enhance the environmental awareness of the students.

1.0 INTRODUCTION

Green building trends are rapidly increasing in residential construction. Green building features are important elements to build better buildings for a better environment and society, such as energy saving, water efficiency, and eco-friendly materials. As acknowledged by Das (2019), green building features in residential projects include energy efficiency, resource management, indoor air quality control, and reducing greenhouse gas emissions. In Malaysia, there is a green building index practice on certain buildings that receive scores from Certified (basic green level) to Platinum (most sustainable). The function is to promote sustainability rating from Certified (basic green level), Silver (more green features), Gold (highly green and sustainable), and Platinum (top-level, most sustainable). As supported by Lim et al. (2021), the Green Building Index (GBI) in Malaysia assesses buildings' sustainability based on energy saving, water efficiency, and indoor quality, with ratings ranging from certified (basic green level) to platinum (most eco-friendly).

Meanwhile, Mohd Arif and Huri (2023) highlighted that high-rise residential buildings are becoming an essential in urban landscapes to cater to the increasing population and land constraints. Vertical communities are not just spaces to live but emphasize promoting sustainable living practices. High-rise residential buildings not only offer excellent city views but also provide amenities such as gyms and pools, shaping customer expectations for quality living spaces (Kolobova, 2018). For students, who often live in high-rise buildings, the integration of green features is not merely a mark of modernity but a vital necessity for a sustainable future.

Mostly in urban areas, high-rise residential buildings have gained popularity among students due to their convenience and accessibility (Globazi et al., 2020). This trend accommodates local and international students, with a variety of cultural backgrounds and economic conditions, resulting in a heterogeneous residential community. These students, often renting apartments, bring diverse expectations regarding their living spaces. For some, integration of green features such as an energy efficiency system is a priority, while others might emphasize waste management or access to green spaces (Zhang et al, 2018). Addressing this various set of preferences is crucial for developing inclusive and environmentally sustainable high-rise communities.

He et al. (2019) revealed that green building features in residential contexts encompass a wide spectrum, including energy-efficient systems, sustainable construction materials, and waste management strategies. Current studies indicate growing students' interest in residences that incorporate green features. However, the preferences are not standardized and often differ between local and international students' groups. Cultural backgrounds strongly shape these choices; for instance, students from regions experiencing water scarcity may place greater importance on water-saving technologies. Economic considerations play a significant role as the affordability of green features commonly determines their preferences. This intersection of cultural and economic factors, therefore, creates a complicated issue that must be examined to better understand students' preferences for sustainable residential environments.

In Malaysia, the difference between local and international students is normally defined by country of origin and residency status. International students refer to those who have come from abroad to pursue their higher education in Malaysian institutions and are generally present under student visa arrangements for immigration purposes. Their transition is commonly caused by challenges related to academic integration, cultural adaptation, and, in some cases, language barriers such as limited proficiency in Bahasa Malaysia or local dialects. Ahrari et al. (2019) addressed that international postgraduate students encounter a combination of academic, psychological, and sociocultural adjustment difficulties, underscoring the importance of enhanced support mechanisms and intercultural awareness within universities. In navigating these circumstances, international students must also comply with immigration requirements and frequently depend on institutional support services and international student offices to facilitate both academic progression and social integration.

Furthermore, local students in Malaysia are Malaysian citizens or permanent residents who pursue higher education in institutions located outside their hometown. Their status is therefore determined by domestic mobility rather than international relocation. While these students are familiar with the national culture and language, their adjustment primarily involves adapting to a new city and academic setting rather than navigating cross-cultural environments. Unlike their international counterparts, they are not subject to immigration procedures; however, they may encounter other administrative requirements, such as updating residential information or managing logistical arrangements associated with relocation. Although they might also seek new social networks, local students generally have easier access to support systems within Malaysia

and can more readily connect with friends and family. As stated by Othman et al. (2021), Malaysia's multiculturalism and family consensus contribute to the decision-making process for international students to study in Malaysia, with cultural diversity, harmony, and courtesy of unity enhancing their confidence in adapting to a foreign environment.

The degree of awareness and knowledge among students about green building features can shape their choices significantly. A general lack of understanding or misconceptions about these features might result in a lower priority placed on green living when choosing rental accommodations. Therefore, Donkor-Hyiaman, Gyamfi-Yeboah, Tudzi, & Bugri (2023) have mentioned that raising awareness and educating students about the benefits of green features are essential. This not only influences their immediate choices but also fosters a sustainable mindset for the future.

As urbanization and environmental concerns rise, universities and housing developers are increasingly adopting sustainable housing solutions. Given that students represent a growing segment of the urban renters, their preferences and expectations towards green building features could influence the future direction of sustainable residential development. However, the extent to which students especially those from diverse cultural and economic backgrounds value these features remains underexplored in the Malaysian context. Additionally, although green building practices are gaining attention, little research has explored how student tenants-who represent a unique and diverse renter segment-perceive and prioritize sustainable housing. Unlike homebuyers, students are temporary residents, which may affect their willingness to pay for or engage with green features. Moreover, while Malaysia's Green Building Index (GBI) promotes eco-friendly housing, the extent to which it influences student accommodation choice remains unclear. Understanding this dynamic is crucial for shaping policies that promote sustainable student housing while addressing economic and cultural barriers to adoption.

1.1 Research Gap

The main research gap underscores the lack of research and understanding of how local and international students' preferences for green building features differ in high-rise buildings (Donkor-Hyiaman, Gyamfi-Yeboah, Tudzi, & Bugri, 2023). This insufficient knowledge hinders the development of student accommodations that are universally appealing and sustainable. Given the increasing demand for eco-friendly living spaces, it's crucial to bridge this understanding gap to ensure that high-rise student accommodations meet diverse environmental and personal preferences.

Furthermore, the influence of cultural backgrounds and economic factors on students' preferences for green features in high-rise residential remains underexplored (Chuweni, Saraf, Fauzi, 2022). This gap poses a challenge in designing inclusive and financially sustainable green living environments. As emphasized by Teotónio, Cruz, Silva, and Silva (2020), considering how economic considerations are shaping individual choices is essential for developing green housing solutions that are not only environmentally responsible but also culturally sensitive and economically accessible to diverse populations. The closest study similar to this research was conducted by Jamaludin et al. (2016) examined the perception of bioclimatic design features among the student population. The study reported on student preferences and overall satisfaction for five design features. The study provides some insights into student preferences for green building features, but has a limited scope on the preferences of local and international students for high-rise residential green building features. Therefore, filling this gap is important as it will help in tailoring building features to diverse occupant needs, thus broadening the appeal of sustainable buildings.

2.0 LITERATURE REVIEW

In the construction industry, green buildings are known as a sustainable responsibility towards the environment through creating resource-efficient structures over their life cycle (Zhang, 2013). As highlighted by Berawi et al. (2020), effective resource operation and maintenance are crucial to determine the successful green buildings implementation while controlling technology and regulation of water and energy consumption. The success factors of delivering green building initiatives rely on the collaboration of important parties such as architects, engineers, clients, and contractors across all stages of project implementation (Zhang, 2013; Kamath et al., 2019). Green building successful features are measured through energy efficiency, the use of recycled and sustainable materials, water conservation, and the integration of a renewable energy system. The

green building objectives also could provide benefits such as promote healthier indoor environments, public health and increase property value (Cedeno et al., 2018).

2.1 Green Building Features

This research discusses on eight (8) green building features, which not limited to solar panels, green roofs, efficient waste management systems, water saving plumbing fixtures, sustainable building materials, energy efficient lighting and appliances, high performance insulations, and rainwater harvesting systems. An important component of green buildings is solar panel which is an infrastructure mainly form from photovoltaic cells that collecting sunlight energy and turn it into power. This renewable energy production could reduce on the reliance of fossil fuel which are limited and inquire high complexities to gain such mineral. Al-Saidi et al., (2021) discuss the application of photovoltaic solar panels in green building actually one of viable finance friendly option to reduce greenhouse gas emissions and save energy.

As one of the key building components, green roof plays an important role in green building features. In the green building, the roof can be called a green roof or eco-roof, where it can be planted on the rooftops. Among their many advantages are better insulation, less urban heat island effect, efficient stormwater management, and aesthetic improvement. The urban heat island effect can be reduced most effectively in closed areas with a green roof that is 70% grass and 30% trees, in semi-open regions with 50% shrubs and 50% trees, and in open areas with 70% grass and 30% trees or 30% grass and 70% trees, according to Park et al. (2022).

Next, important features is efficient waste management systems include putting waste reduction, reuse, and recycling principles into practice. Composting facilities, specific spaces for recycling, and reducing construction waste are some of the features. In comparison to conventional brick or concrete, the new recycled mortar panel with industrial waste additions exhibits good thermal behavior and may even be superior in certain ways, as described by Briones-Llorente et al. (2019). Fourth, one important component of green buildings that has to do with water efficiency is water-saving plumbing fixtures. This is accomplished by installing efficient showerheads, faucets, and low-flow toilets. Gnoatto et al. (2019) claim that dual flush devices and greywater reuse in toilets save electricity and water. Another important feature that is fundamental in green building is sustainable building materials. An essential component of green building is the utilization of sustainable resources. These products, which include FSC-certified wood, recycled steel, low-VOC paints, and bamboo for flooring and furniture, have a small environmental impact and improve indoor air quality. Green building materials, like foam glass, green walls, and ecological cement, lower energy use, emissions, and resource consumption, supporting sustainable development in the building industry, according to Hu et al. (2021). The sixth feature in green building is none other than energy-efficient lighting and appliances with high energy efficiency ratings and LED and CFL lamps. These components contribute to minimizing operating expenses and electricity usage. By lowering wattage bulbs and lamp replacements, LED lighting in Building E, Faculty of Administration at Brawijaya University can save power 2.039.04 kWh and operating costs per month (Revana, Wisnumurti, & Nugroho, 2018). Then, the vitality of high-performance insulation is essential for minimizing heat transfer and preserving indoor temperature. Advanced insulation materials are frequently used in green buildings to improve occupant comfort and energy efficiency. According to Guo et al. (2019), adding more thermal insulation thickness to a detached home with a floor heating system raises the floor temperature and lessens temperature swings while simultaneously improving indoor thermal comfort and energy efficiency. Finally, rainwater-harvesting systems or systems that collect and store rainwater for non-potable applications like cooling, toilet flushing, and irrigation are known as rainwater-harvesting systems. These technologies lessen the building's overall water footprint and save municipal water supplies by using rainwater. In residential metropolitan settings, rainwater collecting systems can successfully lower the risk of flooding; nevertheless, their efficacy is mostly reliant on the amount of rainfall (Freni et al., 2019).

Based on the site inspections on the case study in a green condominium in Shah Alam, the study has identified only five features that match with existing or current literature review. The observation has concluded that this green building has efficient waste management, energy-efficient lighting and appliances, rainwater harvesting, water-saving plumbing fixtures, and energy and high-performance insulation features. The elaboration on the green building features for this building are building orientation that follows North-South position for better natural ventilation and exposure to daylight, adjustable louvered window which assist on airflow and ventilation, motion sensor to reduce the unnecessary wastage of electricity in the common area,

recycle bin to encourage residences to recycle their waste, water efficient sanitary wares to reduce water usage, rainwater harvesting tank for landscaping purposes and heat reflective paint to reduce external heat.

2.2 Housing preferences on Students

Every student may have different housing preferences. Students with a high level of environmental consciousness are more inclined to look for housing that matches their beliefs, according to a prior study on desired considerations for homebuyers (Afiqah et al., 2020). Students favor a number of criteria, including housing near their educational institution (Wijoyo et al., 2019). Financial factor further influences decision-making, as green certified housing may offer higher rental costs due to facilities provided, even though they can reduce long-term costs through energy and water saving features (MacAskill et al., 2021). Safety remains a main concern, and many green buildings apply modern security applications such as access control systems, in line with United Nations (UN) Sustainable Development Goal 11 (SDGs 11), which highlights the importance of creating a safe environment (Ramli et al., 2022). In addition, students always prefer to social amenities such as community areas, recreational facilities, and the opportunity to engage with the community. The integration of ecosystem services into green space can improve human well-being while mitigating environmental issues such as the urban heat island effect (Semeraro et al., 2021).

2.3 Determinants of Housing Preferences

The housing preferences are the grouping of cultural background, sustainability awareness, and economic considerations. This study investigates the housing preferences, particularly for high-rise green buildings, which could be fruitful for the subject. For instance, cultural background is significant in shaping the green building features. For example, local students are more amorous of the surrounding environment and traditions, residential spaces that integrate modern ecological features. While international students which from diverse backgrounds and profiles might prefer features that follow global environmental standards and practices.

Zhang et al (2021) discuss how social factors and individual perception shape the development of green buildings in China. Syahriayah and Bhaskara (2019) had identified the strong correlation between pro-environmental behavior and the adoption of green building principles in residential development in student vertical housing settings. This perspective shows that the national campaign might affect local students' perceptions of sustainability. In addition, the international student from a background of environmental protection regions would have much higher priorities on environmental preservation. The benefits in monetary terms are also not negligible. The green buildings generate economic benefits which reduce operating costs, enhance property values, improvement in occupant health and productivity (Kieu et al., 2020).

2.4 Research Significance

This research is very important which it revealed the untapped subject on the preferences of students on Green Building features. This study presents two perspectives, both local and international. The study is also significant in understanding the behaviour of students in choosing green building features. The behaviour might be derived from awareness, culture, or education that has been received as they grow into adult life (Novieto et al., 2023). The study may find the rooted tradition and effectiveness of the sustainable campaign that has been made by the government.

Helping green policy makers who focus on students' wellbeing based on their preferred features. Premise like university, school or library should be embellished by the green policy makers to enhance the asset value. Typical green certified buildings typically command higher property values and rental premiums due to increased demand. This study could provide insights for the developers to understand the market competitiveness against student preferences or college setting environment which could improve branding, attract eco-conscious tenants, and differentiate the project in a competitive market.

Furthermore, the occupants would have better health and well-being by improved indoor air quality, natural lighting and ventilation with extra comfort and productivity. As a whole, government and policy makers could progress toward national goals which helps achieve carbon reduction, renewable energy targets and sustainable commitments. This research could be bridging the gap of building theory and student housing practices in concurrent enhance greater environmental effort and green lifestyle among local and international young generation (Globazi et al., 2020). This study also promotes green lifestyle among the young generation to nurture environmental concern, such as the fast adaptation of the young generation to use electrical vehicles

(EVs) car or commute to the office. The ambition is not just transportation but, also integrating their shelter and building into a green lifestyle.

3.0 METHODOLOGY

This paper aimed to explore the green building features preferred by the local and international students living in high-rise residential buildings in Selangor, Malaysia. Firstly, this paper examines specific green building features present in the case study. As a result, the green building features preferred by local and international students were presented. The case study selected was a green condominium in Shah Alam, identified as a high-rise residential category of green buildings.

The case study comprised three (3) blocks and 3-storey villas. Block A consisted of 27 storeys with 212 units, Block B consisted of 29 storeys with 228 units, and Block C consisted of 27 storeys with 212 units. Additionally, there were 26 units of 3-storey villas. The green condominium's greenery concept had made it one of Shah Alam's most appealing residential locations. To gain a comprehensive perspective, the research analyzed the preferences of the student residents.

An in-depth interview was conducted with property managers to identify the stratified green building features preferred in housing. One of the findings from the interview session revealed that approximately 150 students were staying in this green condominium. Based on this, the recommended sample size calculated using the Raosoft calculator was 109 students, applying a 5% margin of error and a 95% confidence level. The sample consisted of non-resident (NR) students who stayed outside the university hostel. Consequently, the questionnaire survey was distributed to the community through an online platform. The questionnaire was confirmed to pose no ethical risks to vulnerable groups, as verified through research ethics approval. A total of 109 respondents completed the questionnaire.

3.1 Data Analysis

This research involves a mixed method. An interview was conducted with the property manager, and then a questionnaire was distributed to the specific respondents. Hence, data were analysed using Statistical Software for Social Science (SPSS) version 20.0. The questionnaire used revealed a Cronbach's alpha value of 0.7. A value between 0.0 to 1.0 indicates the reliability of the questionnaire distributed. Higher values (close to 1.0) indicated higher reliability and validity, whereas values lower than 0.6 indicated less reliability. This step was crucial to ensure the data collected was reliable and valid. Descriptive analysis is used to summarize and simplify data for easy interpretation.

The Relative Importance Index (RII) formula was layout in Table 1. The formula was used to calculate the importance index of the respondents on the preferences of Green Building features. The starting value is 0 to 1, in which the closer the RII to 1 perceived higher importance. Aghili et al., (2019) stated that RII approaches were utilized to analyze the importance of management criteria for Green Building performance, sustainable procurement, efficient operation, environmental health, maintenance practices and effective resource management.

$$\text{RII} \quad = \quad \frac{\sum (\text{weight x number of responses})}{\text{Total number of responses x maximum possible weight}}$$

Table 1. Relative Importance Index (RII) formula

Weight	The weight used in this research based on the Likert scale ranging from 1 to 5.
Number of responses	The number of responses in the study collected during data collection process to a given particular weight to the criterion.
Total number of responses (A)	The total number of respondents participate in the data collection process.
Maximum possible weight (N)	The highest value scale used on the study which is 5.

RII is want one of the approaches that can be used to investigate the quantifiable and comparative way to assess importance factors, in this case the respondents' preferences. Every factor's total weighted score was calculated and the RII formula was adopted. Then the scores were ranked from highest to lowest to determine their relative importance index. RII values ranged from 0 to 1, with higher values indicating greater importance. This interpretation of rankings supported effective prioritization in decision-making.

The methodology used was deemed fair due to its simple and intuitive calculation, yet effective in supporting prioritization and informed decision-making. The ordinal data collected were suitable for statistical analysis using the RII, which is widely applied in ranking factors based on respondents' perceptions. Since Likert scale responses produced ordinal data, the RII effectively transformed qualitative rankings into quantitative values for analysis. Figure 1 illustrates the methodological procedures applied in the study. Based on the methodology, the study compared the scores resulting from data analysis between the RII and descriptive analysis for international and local students.
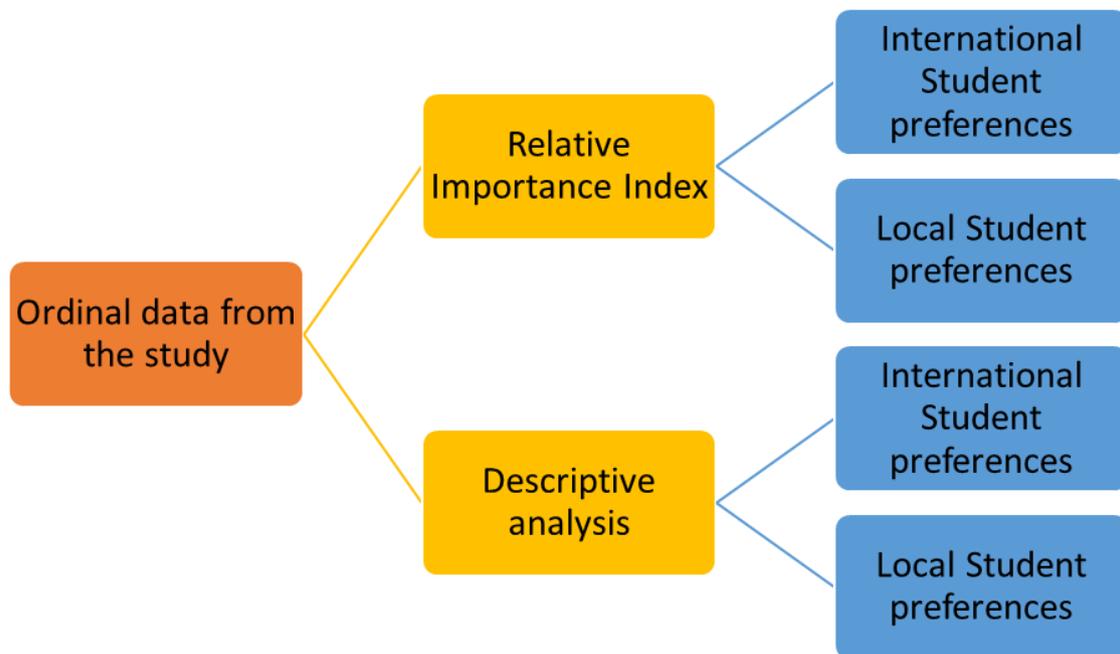

Figure 1. Methodology procedures using Relative Importance Index (RII) and Descriptive analysis.

4.0 RESULTS AND DISCUSSION

From the total of 109 respondents shown in Table 2, 37% were within the age range of 24–26 years, representing the majority of the age group typically registered as postgraduate students. This was followed by 35% of respondents who were between 27–35 years old. In terms of nationality, the highest number of respondents (53%) were Malaysians. This was followed by respondents from Saudi Arabia (12%), Indonesia (9%), South Korea (6%), Nigeria (5%), China (4%), Yemen (4%), and others. Regarding academic status, the majority of the students were postgraduate students (51%), followed by undergraduate students (49%). Additionally, the educational level of respondents showed the highest percentage (36%) at the master's level, followed equally by those at the degree level (36%), PhD (12%), diploma (10%), postdoctoral (3%), and certificate level (3%). All of these results were analysed using SPSS software.

Table 2. Demographic Profile of Respondents.

Characteristics	N	Category	Frequency	Percent (%)
Age	109	18-20	12	11
		21-23	38	35
		24-26	40	37
		27-35	10	9
		35-45	7	6
		45 and above	2	2
Nationality	109	China	5	4
		Indonesia	10	9
		Iran	1	1
		Japan	2	2
		Kenya	3	3
		South Korea	7	6
		Malaysia	58	53
		Nigeria	5	5
		Saudi Arabia	13	12
		Sudan	1	1
		Yemen	4	4
Type of Student	109	Undergraduate	53	49
		Postgraduate	56	51
Education Level		Certificate	3	3
		Diploma	11	10
		Degree	39	36
		Master	40	36
		PhD	13	12
		Postdoctoral	3	3
Length of stay in Green Condominium	109	Less than 6 months	59	54
		6 months to 1 year	24	22
		1 to 2 years	13	12
		More than 2 years	13	12

4.1 Comparison of Students' Preferences for Green Building Features implemented in High-Rise Residential Buildings in Shah Alam, Selangor

Table 3 shows a comparison of the factors influencing the preference for green building features implemented in green condominium, between local and international students. The comparison was analyzed through the relative importance index and descriptive analysis using the mean. Local students prefer the recycle bin as the first rank for green building features, with the highest RII (0.789) and mean (3.95). This indicates that respondents prefer to recycle their waste as an important feature of Green Condominium. Followed by the North-South Orientation for better natural ventilation and daylight with RII (0.786) and mean (3.93); heat reflective paint for the exterior to reduce external heat gain with RII (0.782) and mean (3.91); and an adjustable louvered window to facilitate airflow and ventilation with RII (0.779) and mean (3.90). Hence ranked fifth is the rainwater Harvesting Tank for landscaping purposes with RII (0.779) and mean (3.90); followed by the Water Efficient Sanitary Wares and Fittings to reduce water usage with RII (0.758) and mean (3.79); Low Volatile Organic Compounds (VOC) Paint for Interior for better indoor air quality with RII (0.758) and mean (3.79) and last ranked is Motion Sensor (Reduces unnecessary wastage of electricity at low traffic common areas) with lowest RII (0.755) and mean (3.78).

In contrast, international students prefer water-efficient sanitary wares and fittings, with the highest RII (0.800) and mean score of (4.00), showing a significant emphasis on water conservation. The north-south orientation follows closely (RII: 0.792, mean: 3.96), indicating their preference for optimizing natural ventilation and daylight. Motion sensors are also valued (RII: 0.780, mean: 3.90), highlighting their preference for energy-efficient and resource-saving features. Recycle bins are also important to international students,

with RII (0.780) and a mean score of (3.90). Adjustable louvered windows are the least preferred among international students, with RII (0.752) and a mean score of (3.76), suggesting they may not find this feature as critical compared to other green building aspects. Overall, while both groups value sustainability, their specific priorities differ, with local students favoring recycling and international students emphasizing water efficiency and energy savings.

Overall, local students prefer to recycle waste compared to international students prefer to emphasize water conservation. Furthermore, the result shows a similar ranking between the Relatively Important Index and the mean analysis. This indicates a relative importance index, and mean analysis can validate the findings for the factors influencing preference for green building features in Green Condominium.

Table 3. Comparison of the Factors Influencing Preference for Green Building Features Implemented in High-Rise Residential Building.

Ranked	Local Students				International Students			
	Relative Importance Index		Descriptive Analysis		Relative Importance Index		Descriptive Analysis	
	Features	RII Value	Features	Mean	Features	RII Value	Features	Mean
1	Recycle Bin	0.789	Recycle Bin	3.95	Water Efficient Sanitary Wares and Fittings	0.800	Water Efficient Sanitary Wares and Fittings	4.00
2	North-South Orientation	0.786	North-South Orientation	3.93	North-South Orientation	0.792	North-South Orientation	3.96
3	Heat Reflective Paint for Exterior	0.782	Heat Reflective Paint for Exterior	3.91	Motion Sensor	0.780	Motion Sensor	3.90
4	Adjustable Louvered Window	0.779	Adjustable Louvered Window	3.90	Recycle Bin	0.780	Recycle Bin	3.90
5	Rainwater Harvesting Tank	0.779	Rainwater Harvesting Tank	3.90	Heat Reflective Paint for Exterior	0.772	Heat Reflective Paint for Exterior	3.86
6	Water Efficient Sanitary Wares and Fittings	0.758	Water Efficient Sanitary Wares and Fittings	3.79	Low Volatile Organic Compounds (VOC) Paint for Interior	0.768	Low Volatile Organic Compounds (VOC) Paint for Interior	3.84
7	Low Volatile Organic Compounds (VOC) Paint for Interior	0.758	Low Volatile Organic Compounds (VOC) Paint for Interior	3.79	Rainwater Harvesting Tank	0.760	Rainwater Harvesting Tank	3.80
8	Motion Sensor	0.755	Motion Sensor	3.78	Adjustable Louvered Window	0.752	Adjustable Louvered Window	3.76

4.2 Comparison of General Green Building Features

Table 4 presents a comparison of general green building features that were not implemented in the Green Condominium. Although these green features were widely recognized in sustainable construction, they were absent from the case study building. For instance, high-performance insulation had not been installed, possibly due to its high installation cost. Even though the respondents had not experienced the features listed in Table 3 firsthand, understanding their responses was essential to gauge their level of interest and preference for such features.

Among local students, the first ranking showed differing outcomes. The Relative Importance Index (RII) ranked high-performance insulation the highest (RII: 0.875), while the mean score favored the use of low Volatile Organic Compounds (VOC) paint for interior spaces (mean: 3.79). For the second ranking, solar panels were prioritized (RII: 0.868), while high-performance insulation received the highest mean score (mean: 4.34). In third place, local students selected green roofs (RII: 0.855, mean: 4.28), followed by water-saving plumbing fixtures (RII: 0.834, mean: 4.17).

On the other hand, international students prioritized water-saving plumbing fixtures as the most important feature, with the highest RII (0.894) and mean score (4.45), reflecting a strong emphasis on water conservation. Solar panels were ranked second in RII (0.890) and mean score (4.43), indicating a preference for renewable energy solutions. This was followed by high-performance insulation RII (0.866) and a mean score (4.31). Green roofs were fourth-ranked RII (0.862) and mean (4.29), revealing equal concern for both energy efficiency and environmental benefits. In particular, local and international students demonstrated a strong responsibility to save the environment.

Table 4. Comparison of the General Green Building Features.

Ranked	Local Students				International Students			
	Relative Importance Index		Descriptive Analysis		Relative Importance Index		Descriptive Analysis	
	Features	RII Value	Features	Mean	Features	RII Value	Features	Mean
1	High-Performance Insulation	0.875	Low Volatile Organic Compounds (VOC) Paint for Interior	3.79	Water-Saving Plumbing Fixtures	0.894	Water-Saving Plumbing Fixtures	4.45
2	Solar panels	0.868	High-Performance Insulation	4.34	Solar panels	0.890	Solar panels	4.43
3	Green roofs	0.855	Green roofs	4.28	High-Performance Insulation	0.866	High-Performance Insulation	4.31
4	Water-Saving Plumbing Fixtures	0.834	Water-Saving Plumbing Fixtures	4.17	Green roofs	0.862	Green roofs	4.29

4.3 Comparison of the Factor Influencing Preference for Green Building Features

Table 5 demonstrate the list of factors affecting preferences for green building features using Relative Importance Index (RII). The local student preferred sustainability awareness (RII: 0.896, mean score: 4.48) as the most significant factor for the Green Building features. The next factors are economic considerations (RII:

0.868, mean score:4.34) and cultural background (RII: 0.855, mean score: 4.28). These results are indicating that local students prioritized environmental consciousness and economic benefits when evaluating Green Building features.

The international student selects the cultural background and sustainability awareness (RII: 0.866, mean score: 4.31) as equal important factors when evaluating Green Building features. Next, last consideration fall under economics considerations (RII: 0.858, mean score: 4.27). The RII values themselves also highlight a noteworthy pattern; local students' strongest factor, sustainability awareness (RII: 0.896), reflects a slightly higher level of importance compared to international students' top priorities (RII: 0.866). Although both groups demonstrated strong appreciation for sustainability related factors, the marginally higher RII among local students suggest a more consistent prioritization of environmental awareness, potentially influenced by long standing national sustainability campaigns. The consistency validated the findings and supported the use of both RII and mean analysis as effective tools for identifying the factors influencing students' preferences for Green Building features.

Table 5. Comparison of the Factors Influencing Preference for Green Building Features

Ranked	Local Students				International Students			
	Relative Importance Index		Descriptive Analysis		Relative Importance Index		Descriptive Analysis	
	Factors	RII Value	Factors	Mean	Factors	RII Value	Factors	Mean
1	Sustainability Awareness	0.896	Sustainability Awareness	4.48	Cultural Background	0.866	Cultural Background	4.31
2	Economic Considerations	0.868	Economic Considerations	4.34	Sustainability Awareness	0.866	Sustainability Awareness	4.31
3	Cultural Background Influences	0.855	Cultural Background Influences	4.28	Economic Considerations	0.858	Economic Considerations	4.27

This research compared the preference between local and international students living in high rise residential buildings in relative of green building features. The study was conducted in one of Green condominium in Shah Alam. The survey data analysis provided different outcome in between of the two groups highlighting their priorities were differing towards green building features. Local students have tendency towards recycle projects and recycling facilities. For international students, the highest preference was for water-efficient sanitary wares and fittings, reflecting their strong emphasis on water conservation. Conversely, adjustable louvered windows were the least preferred feature among this group.

Regarding general green building features, local students placed the highest importance on solar panels, which reflected a strong preference for renewable energy sources. Interestingly, the least preferred general feature for local students was water-saving plumbing fixtures, although this feature still received relatively high scores. On the other hand, international students prioritized water-saving plumbing fixtures above all others, while high-performance insulation was the least preferred general feature in their responses. In terms of the perceived importance of green building features, local students valued the conservation of natural resources the most, followed by long-term sustainability and efforts to reduce their carbon footprint.

Local student indicating that promoting a healthier living environment was rated as the least important factor. The international student in the other way considering their healthier living environment as their top priority, while conserving natural resources is their least favoured factor. In relation of the factors affecting preferences for green building features, local students were most influenced by sustainability awareness, economic considerations while cultural background has the lowest impact. In other different situation, international students have state high agreement on the significance of cultural background and sustainability awareness with the financial considerations being the least significance.

Yau et al., (2014) and Yau (2012) suggested that economic incentives played an important role in motivating individuals' willingness to pay for green features. The specific green features identified in this study, like sustainable materials, energy efficient technologies, and water saving devices, aligned with their findings. In general, both students (local and international) acknowledged appreciation for sustainability, though their specific priorities differed. Local students emphasized recycling and resources conservation might be due the national campaign that have been organized to promote the recycling, reuse and renewable programme. However, international demonstrated greater concern for water efficiency and promoting a healthier living environment.

To further strengthen individuals' willingness to adopt green features, institutional and policy level support becomes equally important. Beyond personal preferences and cultural influences, structural mechanisms such as government subsidies and incentives can play a pivotal role in reducing financial barriers and accelerating the adoption of green housing. Furthermore, Yau et al., (2014) emphasize that government subsidies were identified as a potential driver to encourage the adoption of green housing. Meanwhile, market forces could support green development if consumers were willing to pay for such features.

Chuweni et al. (2024) further emphasized the significance of initiatives for incentives, who suggested that more incentives should be introduced to promote green and resilient cities in Malaysia, with the target of net-zero carbon emission by 2050. In addition, other important factors to be considered are, establishment of green building official databases to provide accurate and transparent information. Supporting Chuweni et al.'s (2024) argument, Li et al. (2024) verified through their study in Nanjing City that people's willingness to pay for green buildings is enhanced by the transparency of green building information. In the Malaysian context, green features in residential reported to increase property value between 2% and 6.5%. As students are more likely to rent than to buy, this created a justification to charge a higher rental rate for units with green features (Goh et al., 2022).

5.0 CONCLUSIONS

The study investigated the preferences of local and international students on green building features in high-rise residential settings in Selangor. The data from this study were obtained through interviews with property managers and survey responses from the students residing at the Green Condominium in Shah Alam. Based on the discussion, the study concluded that there are several features appreciated by the students, such as building orientation to have enough ventilation, recycling bins, solar panels, water savings plumbing fixtures.

These features reflect long-term sustainability, reducing carbon emissions and conserving natural resources, which are valued by the students generally. The study could state that the students have shown concern about sustainability and the habit of caring for resources. However, based on the two different groups; the behavior differs, where local students much prefer recycling practices and resource conservation, which might be due to the national campaign that has been promoted by the government, which makes them more near of this sustainable practice.

The international student shows a deep care of water efficiency and health oriented living environments that focus on the internal healthiness of the body in contrast from the local student whereas much more caring on the environment and surrounding. This shows that the value of sustainability differs and needs much more in-depth analysis.

This research suggests that in the future, the researchers should focus on comparative analyses across regions, institutions, and demographic groups will provide deeper insights into whether sustainability priorities are universally shared or shaped by cultural, socioeconomic or geographic factors. 'Ulyani et al (2021) also promotes such investigations would not only enhance academic position on sustainability in the built environment but able to guide policymakers, developers and higher education institutions in tailoring green building initiatives to meet diverse student expectations.

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