



## **STRATEGIES, CHALLENGES AND SOLUTIONS TOWARDS THE IMPLEMENTATION OF GREEN CAMPUS IN UiTM PERAK**

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### **Abstract**

Green initiatives have become a phenomenon globally now. This has taken seriously all parties regarding the process of environmental sustainability. Sustainable Development Goals had been used as a guideline towards this agenda. The Malaysian government issued the Green Technology Policy in July 2009 to accelerate the national economy and promote sustainable development. Meanwhile, green technology has been applied to universities in Malaysia to achieve green campus status under the UI Green Metric. Numerous universities in Malaysia have begun to take this issue seriously, including UiTM Perak. Three research objectives had been developed; (1) to determine strategies in promoting green campus in UiTM Perak, (2) to identify challenges in implementing green campus in UiTM Perak and (3) to recommend solutions to overcome the challenges in implementing green campus in UiTM Perak. A qualitative method approach by using a semi-structured interview with the Green Campus Committee had been adopted. The data is analysed using content analysis. The research revealed that despite several green initiatives implemented by UiTM Perak, there are also challenges occurring. Among them are financial, awareness and knowledge. To overcome these challenges, the management of UiTM Perak had outlined several actions to be taken. In conclusion, the green campus initiative can give many benefits towards a sustainable environment in UiTM Perak. Indeed, this agenda needs support by all parties.

**Keywords:** Green initiatives, strategies, challenges; green campus, UiTM Perak

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## **INTRODUCTION**

Green Campus rewards long-term obligation to continuous environmental improvement from the campus community. Green Campus status is attained by making significant improvement in across campus community collaboration under one or several of the following themes: Settings and Infrastructure, Energy and Climate Change, Waste, Water, Transportation and Education. The Universitas Indonesia GreenMetric Rankings are provided for universities to measure and assess the level of sustainability of the environment in the campus (Uche et al., 2013). According to Omar, Saruwono and Mohammad (2010) green campus refined the quality of human life while living within the carrying capacity of supporting ecosystems. Its implementation in higher education institutions can give many benefits to the campus community by living in a harmonious environment and green lifestyle. Indeed, universities hold responsibility in implementing sustainable universities on campus to promote sustainability culture among their students and staff.

Numerous leading universities across the world have been implementing this agenda including Malaysia. However, despite several green campus initiatives taken, there are also challenges. This research aims to examine challenges in implementing green campus at UiTM Perak. In line with this, three research objectives were established (1) to determine strategies in promoting green campus in UiTM Perak (2) to examine the challenges in implementing green campus at UiTM Perak and (3) to propose solutions in implementing green campus at UiTM Perak.

## **LITERATURE REVIEW**

### **Definition and the Importance of Green Campus**

Most researchers have similar definitions on green campuses. Hosna Ajilian (2014) and Husaini and Jusoh (2017) defined green campus as sustainability made and kept up the conditions in which people and nature can exist productively, permitting social, economic and environment to advance. Uche et al. (2013) stated that green campus can be referred to as reducing negative impacts on environment pollution and human health to promote environmental sustainability. Concurring into this, Ragazzi and Ghidini (2017) added that in promoting green campus, the university should use their resources and experiences in teaching, research, and stewardship in approaches to enable society to make changes to a green lifestyle.

There are several benefits and importance to implementing a green campus as stated by numerous scholars. Omar, Saruwono and Mohammad (2010) mentioned that the green campus aims to improve and promote sustainability and work with others to implement and practice sustainability development. Green campus initiatives confirm the well-being of humans by integrating economic

viability, conservation and protection of environment and social equity throughout construction, operation design, maintenance and waste (Yiing, Yaacob & Hussein, 2013). In addition, green campus will minimise negative environment, economic, society, and well-being impacts of the campus communities towards a better practical lifestyle (Kristanto et al., 2017; Ragazzi & Ghidini, 2017; Foo, 2013).

Sahoo (2008) stated that a green campus will diminish the maintenance cost and productivity gains for the residents of the campus. The sustainable campus can create teaching future experts and improve skills and knowledge on sustainability development. It also enhances energy proficiency on campus, moving to renewable energy, food and other possessions used on and off campuses. Moreover, it can improve the university's social responsibility on environment protection and conservation resources (Yuan, Zuo & Huisingh, 2013). University Environment management system (EMS), which relates to environmental management initiatives on the campus for decreasing environmental effects and for development of a greener campus.

Xiong et al. (2013) viewed green campus as green education via green curriculum. Through a green curriculum, knowledge and information about green campuses can be distributed to all individuals. Green campus or sustainability universities are firmly identified with interdisciplinary, innovation, and complexity. Subsequently, it requires alternate approaches such as online learning rather than traditional, lecture-based pedagogy (Du, Su & Liu, 2013) to reduce energy use and wastes on campus. Indeed, it requires commitment and the firm administration of the university itself (Castro, José & Jabbour, 2013). Education for Sustainable Development also empowers individuals to build up the learning, value and aptitudes to make decisions on the method in which they were done by an individual or grouping, locally or globally that enhance the personal satisfaction without harming the planet (Kay, Hassan & Che, 2012).

#### **University Sustainability Ranking System: UI GreenMetric**

There are various global sustainability rating tools available such as GREENSHIPS, The Sustainability, Tracking, Assessment and Rating System (STARS), The College Sustainability Report Card @ Green Report Card and UI GreenMetric. Amongst these rating tools, UI GreenMetric is the most widely used in Asian, European and U.S. universities (Lauder et al., 2015).

The UI GreenMetric is a tool to assess the sustainability of universities and is a simple tool for self-assessment of campus sustainability efforts. Its aim is to assess policies and activities within green campuses so as to promote a sustainability culture in higher education institutions worldwide. Ragazzi and Ghidini (2017) acknowledged that this ranking is considered as the most important global sustainability ranking for universities as it allows universities to share their experience and best practices on sustainability issues, as well as to

measure their sustainability policy, facilitating a comparison between them. UI GreenMetric has developed their ranking instrument based on the sustainable development concept that encompasses the three Es of mutually reinforcing pillars: Environment, Economics and Social (Suwartha & Sari, 2013). There are six categories used in the ranking with their weighting and indicators (UI GreenMetric, 2016) and (Benjaoran & Chunko, 2018). A total of 39 indicators are provided for the categories and a specific score is assigned to each indicator. These are (i) Setting and Infrastructure (*Weighting-15*, 6 indicators), (ii) Energy and Climate Change (*Weighting-21*, 8 indicators), (iii) Waste (*Weighting-18*, 6 indicators), (iv) Water (*Weighting-10*, 4 indicators), (v) Transportation (*Weighting-18*, 8 indicators) and (vi) Education (*Weighting-18*, 7 indicators). The final score is the sum of the scores achieved for each indicator.

### **Challenges in Implementing Green Campus**

Hosna Ajilian (2014) stated that lack of indicators to measure sustainability in higher education institutions is among the challenges in implementing a green campus. There is a lack of organization initiatives to concentrate on the relationship among the indicators in universities since the universities only focus on research, education, community and operation (Husaini & Jusoh, 2017). Failure to select suitable indicators may result in lack of a clear opinion on sustainability. In Malaysia, the use of sustainability gage is still new and very uncommon in practices (Darus & Atikah, 2012). The common challenges are that higher education institutions are the non-current of systematic framework to precisely measure campus initiatives and deficiency of specialists to be able to and conserve the environment (Luís, 2015). Moreover, absence of motivations from universities to encourage green education and activities to all communities in campus, lack of construction standards and control from authority to ensure the quality environment is safe and higher maintenance cost (Abubakar, 2020). Likewise lack of education and activities in sustainable design and development (Tarigan, Prayogo & Mardiono, 2012).

According to Hopkins and Hopkins, (2016), lack of knowledge and exposure among the university facilities director about sustainable development is another challenge in supporting the green campus agenda. There is also a lack of motivation at the faculty to reduce maintenance cost and long-term energy. Tiyarattanachai and Hollmann (2016) recommended that a green campus may not be the best if the university is not well prepared for it. Green campus agenda needs support from all university stakeholders such as the management team, faculty members, staff, students, parents and its alumni (Yuan, Zuo & Huisingh, 2013).

Besides that, campus expansion has changed the mode of transportation to motor vehicles in universities, thus contributing to traffic congestion, reduction

of air quality and unhealthy environment in campus. This gradually affects green spaces in the campus (Foo, 2013).

### **The Implementation of Green Campus in Malaysian Public Universities**

In general, there are several universities in Malaysia that have adopted green campus initiatives. It is reported that 17 from 20 listed Malaysian public universities have participated in the UI Green Metric and five of the universities are in urban areas. Among the universities according to the highest ranking are Universiti Putra Malaysia (8000 score), Universiti Malaya (7900 score), Universiti Teknologi Malaysia (7275 score), Universiti Teknikal Malaysia Melaka (6775 score) and Universiti Sains Malaysia (6450 score). The universities concurred that green initiatives are very important towards university's sustainability, particularly for energy efficiency, water saving, less waste, and less carbon in campus and can progress a healthy environment. However, the implementation of green campus initiatives varied in every university in Malaysia.

Several previous studies (Gholami et al., 2020; Gomez et al., 2019; Razman et al., 2018) highlighted the several green campus initiatives that had been implemented by the Malaysian public universities. Among the universities and their strategies are:

- a) Universiti Sains Malaysia (USM) - implemented a future sustainable platform to support the major international goals such as the Millennium Development Goals and Education for Sustainable Development. In doing so, USM opted to venture forward based on the "Blue Ocean Strategy", which requires a unique and innovative way of thinking, taking actions and setting goals compared to the norms
- b) Universiti Utara Malaysia - won the global gold medal at the Green World Award 2016 for education and training and being known as the Ambassador of Green World 2016/2017. The university had implemented Electric Pedal-Assisted Bicycles as its initiative towards promoting green campus
- c) Universiti Teknologi Malaysia - introduced preservation policy and framework of comprehensive programme to give ordinary balance on environment, reduce carbon, practice to protect resources, waste/garbage reduction and increase in recycling
- d) Universiti Teknologi MARA (UiTM) - has established the Institute Sustainable Initiatives UiTM that consists of ten faculties and 39 excellence entities to initiate Greenation @ UiTM. This institute was initiated to stimulate and encourage students and visitors on sustainability, experience, and interaction towards a healthy lifestyle.

### **Green Campus Initiatives in UiTM Perak Branch**

The implementation of a green campus in UiTM Perak is included in the UiTM Perak Branch Strategic Plan (2016-2020). The objective is to create a green and harmonious environment within campus and in line with the university motto i.e., Learning in Green Environment. There are five green campus teams under this committee namely Green Technology Design and Infrastructure, Green Office, Green Lifestyle and Recreational Support, Green Entrepreneurship and Innovation and Green Education and Awareness. Each of the team have different responsibilities and functions in implementing Green Campus Strategies.

The Green Technology, Design, and Infrastructure team are to implement green construction and green technology. It leads to the use of green materials, natural ventilation, and natural lighting on buildings. Other than that, for green technology, this strategy emphasises more on energy efficiency, reduction of waste and water saving. There are several green technologies that can be used to achieve green campus goals such as installation of solar workbench and Lighting Emitting Diode (LED) that will contribute to energy efficiency.

The Green Office team focuses on staff only, which is within office management of every department in UiTM Perak. Meanwhile, the Green Lifestyle and Recreational Support team was recognised to encourage all communities to be involved in green activities and green campaigns in UiTM Perak. They can impart and educate the community about green campus lifestyle with a happy and fun program.

The Green Entrepreneurship and Innovation team has the main roles in creating many entrepreneurs and fertigation activities in UiTM Perak that can generate income. The team also encourages students and staff to get involved in green entrepreneurship activities. Finally, the Green Education and Awareness team is to share knowledge and awareness about green campus in UiTM Perak. The team is responsible for organising green talk/seminars, conferences, and workshops to educate campus communities on sustainable matters.

### **RESEARCH METHODOLOGY**

A qualitative method was adopted via semi-structured interviews. The Coordinator of Green Campus UiTM Perak (R6) and five heads of every green campus team were selected. They were requested to explain the strategies and challenges in implementing a green campus in UiTM Perak, as well as the solutions to overcome the challenges. These teams are the Head of Green Technology, Design & Infrastructure (R1), Head of Green Office (R2), Head of Green Lifestyle and Recreational Support (R3), Head of Green Entrepreneurship and Innovation (R4) and Head of Green Education and Awareness (R5).

During the interview, they were briefed on the overall procedure before their expert opinions on green campus inventiveness were asked. Every interviewee was given a standard question to ensure that their comment was

consistent and in a comparable platform. Next, the data obtained is analysed using content analysis.

## **FINDINGS AND DISCUSSIONS**

### **The Strategies in Promoting Green Campus**

#### *Green projects and green activities*

There are many strategies implemented by UiTM Perak in promoting green campus. According to R1, R2, R4 and R5, under the Green Campus Team, UiTM Perak has organised several green projects and green activities to educate campus communities on green elements. Among the projects undertaken are:

- a) solar charging hub besides the library building to generate electrical energy. The solar panel can supply electrical energy to the library compound and will reduce electrical supplies dependency from the Tenaga Nasional Berhad (TNB).
- b) changing from fluorescent to light-emitting diode (LED) lamp. LED lamps are installed in every building in UiTM Perak phase by phase. It can reduce the electricity consumption rate because LED is very efficient for energy saving.
- c) usage of bottles in the reddening cistern to reduce the use of water and increase water pressure during flushing.
- d) reuse of rainwater or lake water to water the fields and trees in the campus. Lake water will be pumped out by using an electric water pump and the water will be distributed to all pipes to water the field and trees
- e) provide rainwater harvesting at the college rooftop. This activity contributes to water saving. Rainwater will be collected and stored in a water tank to be used.
- f) reduce the usage of polystyrene and straw in the campus at all cafeterias/canteens in the campus. They are recommended to use other alternative materials such as oil paper to replace polystyrene as a food wrapper.
- g) construction of a green roof at the architecture building. This is a collaboration project between the green committees and students.
- h) tree planting at office buildings or also known as biophilic. It focuses on every department office building at UiTM Perak. By planting small trees such as cacti will help to increase the quality of oxygen in the working space of an office.
- i) fertigation of various types of fresh vegetables such as tomatoes, chillies, and others. This activity is for all UiTM Perak communities. The vegetables will be sold under the Malaysian Academy of SME & Entrepreneurship Development (MASMED) of UiTM Perak to generate income. Organic fertilizer is used for the fertigation process to make sure the product is safe and does not convey any harm towards consumers.
- j) generating income through '*Madu Kelulut*'. This is a collaboration project between UiTM and Federal Agricultural Marketing Authority (FAMA). The honey products will be sold to FAMA. FAMA will manage all the works in terms of operation and honey extraction process whereas UiTM Perak will provide space and nests.

#### *Campaign on green campus*

R1, R3, R4 and R6 indicated that executing a green campus campaign in UiTM Perak is one of the strategies to enhance the campus communities to be more concerned about the importance of a sustainable environment. Among the campaigns organised by the Green Campus Committee are:

- a) sticking saving energy stickers at every switch at the office and classroom.
- b) organising the Recycle, Reuse and Reduce (3R) program.
- c) reduce the use of plastic, polystyrene, and straw on campus.

These campaigns aimed to create awareness and educate UiTM Perak communities on how to live in a good environment. Despite organising green campaign awareness, R5 and R6 viewed that sharing knowledge about green campus using email and social media is the best approach to promote green campus, particularly among students. On top of that, the Green Campus Committee and UiTM Perak Corporate Unit had launched a green campus official website to convey all information about green campus at UiTM Perak.

R5 stated that the Green Education and Awareness team had proposed a green hub as a one-stop information centre providing information and knowledge about green campus and all UiTM Perak green activities to the communities. It has been approved by UiTM Perak top management and currently is under construction. This is in line with (Lozano et al., 2013) stating that green education should be integrated into every community to promote the concept of sustainability.

#### **Challenges in Implementing Green Campus**

##### *Lack of financial*

*Majority of the interviewees* agreed on the main challenges in applying for a green campus due to lack of financial. According to R1 and R2 the cost for implementing a green campus is very expensive. Concurring to this, Finlay, Massey and Massey (2012) stated that the main issues in implementing a green campus are inadequate financial resources for initial investment. Idris et al. (2015) stressed that the cost will be much higher than the normal building due to the specification of green elements and the limitation of green product suppliers. With these issues in hand, R4 and R5 implementation of green campus in UiTM Perak is planned according to phases, thus, it took a longer period.

##### *Lack of knowledge and awareness*

Lack of knowledge on green campuses among staff and students are highlighted by R1, R2, R3 and R6 as among the challenges in implementing a green campus in UiTM, Perak. According to Yuan, Zuo and Huisingh (2013) and Hopkins and Hopkins (2016), lack of knowledge among staff's management will affect the implementation of sustainability higher education fail. Tiyyarattanachai and

Hollmann (2016) emphasized that a green campus agenda may not be the best approach for every university, particularly if the organisation is not ready for it. He highlighted that awareness about sustainable universities are influenced by several factors such as age, gender and level of education. There is still a lack of research on sustainability in the university curriculum and sustainable development resulting in the failure in implementing the green campus agenda (Uche et al., 2013).

R2 and R3 indicated that it takes time to educate and change human behaviour to be more concerned about a sustainable environment. They found that it is difficult to gain full participation among staff to attend green workshops or green talk organised by the university. Perhaps they are busy with lectures and other university programmes or they are not interested in the area.

#### *Maintenance issues*

R4 highlighted the disturbance of wild animals such as monkeys, dogs and boars as among the challenges in implementing a green campus in UiTM Perak. He added that the animals had harmed almost all vegetation areas and the bee nest (*Madu Kelulut*) for food and vandalised the facilities at the academic block.

Meanwhile, R1 and R6 stressed on the maintenance issues. It is because each green campus project and initiative are essential to be preserved and maintain its performance. So, it can avoid damage and operational failure due to weather conditions and overall period taken. This is in line with (Uche et al., 2013) stating that green initiatives and development require frequent maintenance works and this involves high cost to preserve quality and performance by phase to ensure efficiency and effectiveness of the green elements. Yet, there is a lack of experienced workers to manage green campus projects and to maintain the performance quality.

#### **Solutions to Overcome the Challenges in Implementing Green Campus**

##### *Green workshop, green education, experience committee and participation among student and staff*

R2, R3 and R6 indicated that green education was one of the subjects that must be taken by all students in UiTM Perak. This can change their mindset and behaviour against the importance of a sustainable environment. There are many topics that should be included for green education such as energy efficiency, waste, transportation, water saving and others. Also, competition-based initiatives and programmes are effective mechanisms for a green environment (Aziz & Said, 2018) are also recommended to be structured among UiTM Perak's students and staff. For staff, green workshops or green talk/seminars have to be organised. The participation and support is the key to achieve green campus goals to spread the green campus strategies to all communities in UiTM Perak. Hence, this will yield a harmonious atmosphere as we live in a healthy environment since all parties are involved and concerned about a green campus and a sustainable environment. To advance the quality of the environment, it is important to plan a green program that everyone in a

certain area can participate in (Kristanto et al., 2017). R6 also added that green education must be taught from childhood to develop a good attitude towards the environment. This is in line with Xiong et al. (2013) stating that green education should be implemented in the universities at all faculties to encourage the idea of sustainability. Moreover, he added that publishing of "green course books" and relative journals ought to be encouraged in each academic course.

#### *Appoint support staff and experience committee*

R3 and R5 stated that the Green Campus Committees require more support staff to assist the tasks systematically. Currently, the majority of green committees are lecturers. They are quite busy and do not have enough time to divide between the lecture sessions and green campus works. R4 suggested that the Green Campus committee should be familiar with the implementation of a green campus. By adopting a qualified green initiative, management can make the university achieve environmental sustainability and green campus status (Sahoo, 2013). According to (Kristanto et al., 2017) a strong commitment from campus management is some of the key factors that need to be considered when such an environmental sustainability program is initiated. Thus, well-founded affirmative policies that could affect human behaviours (Bakar, Mustapa & Mohammad, 2020), intervention measures in form of subsidies (Nasrudin et. al., 2020) along with the commitment are seemed the plausible way forward to inculcate comprehensive green campus measures.

## **CONCLUSION**

The strategy for sustainable campus development needs a complete understanding of the factors involved in the complete operations of the university. In Malaysia, since most of the public universities were built before the awareness of sustainable development declaration, to achieve a sustainable campus is a challenge. The commitment of all stakeholders, including the campus community is important.

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