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DEVELOPING AN ECO-CULTURAL EDUCATIONAL CENTRE AT IIUM GOMBAK CAMPUS

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ABSTRACT

Environmental and cultural education are vital and have historically aided official and informal education. It will be a great experience for the learners to apply their knowledge in a real-world context. However, it is possible that it will not be integrated into official teaching in higher learning institutions. It can be seen from the way the campus grounds are designed. An initiative that can be done to deliver high-quality education on environmental and cultural awareness is to create spaces for focused education or edu-tourism attractions. Hence, this project intends to create a proposal to develop an eco-cultural educational centre on the IIUM Gombak campus. It will be designed through environmental preservation to create nature-based experiential learning outdoor spaces. The strategies would be to identify environmental education categories and experiential learning principles for incorporating them into landscape design, analyse the site's natural and cultural resources to identify opportunities, and formulate relevant landscape design strategies for eco-cultural education using an experiential learning approach. The study used a combination of descriptive and numerical analysis to identify natural and cultural resources as well as the potential of the area. According to the study, the IIUM campus grounds, with their natural resources and cultural settings, offer significant potential for development as an eco-cultural educational institution. Thus, a landscape master plan for an eco-cultural educational centre on the IIUM Gombak campus, as well as a detailed development plan focusing on the Rumah Kutai area, have been put forth.

Keywords: *Edu-tourism, environmental education, Malay culture education, experiential learning, campus ground*

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PROJECT INTRODUCTION

The concept of environmental and cultural education is not something new to the ears. Many emerging movements focused on resource recovery and ecological studies inspired profound reflection on the interactions between people and the environment. Not only that, conserving local culture has become one of the most significant local government undertakings. Its goal is to ensure that traditional culture does not go away over time if there are no more people to study and appreciate it.

Despite this, many current generations have little interest or understanding of the current environmental crisis, and they must be educated about the need of cultural preservation in order to inculcate early awareness in their minds. To attract these generations' interest, experiential learning can be integrated into their learning process. Experiential learning is a method to develop skills through direct experience, focused reflection, and purposeful engagement between educators and students. In contrast to traditional educational environments where learners may compete against one another or remain bored or frustrated, learners collaborate and learn from their peers in a more semi-structured environment in experiential learning situations.

Hence, a centre for eco-cultural education would be an effort to provide quality education, focusing more on environmental and cultural awareness.

PROJECT ISSUES

Generally, many campuses may not be utilising their campus ground to instil environmental and cultural awareness in their community. Using the IIUM Gombak campus as the project research area, it can be seen that the following issues are also noticed on the campus:

1. Most of the external spaces in IIUM Gombak were yet to be maximised and utilised for educational purposes (see Figure 1);
2. Conventional indoor teaching and learning were the main focus of the campus educational system (see Figure 2); and
3. A lot of students had expressed their interest for outdoor educational settings that were combined with experiential learning.



Figure 1: External spaces in IIUM



Figure 2: Indoor conventional learning and teaching (Source: Rosazura Jasmi, 2019)

AIM AND OBJECTIVES

Consequently, this project aims to propose the development of an Eco-Cultural Educational Centre on the IIUM Gombak campus through environmental preservation and nature-based experiential learning with the following objectives:

1. To identify the environmental education categories and experiential learning principles for use in landscape design;
2. To analyse the site's natural and cultural resources to identify opportunities for environmental and cultural education; and
3. To formulate the landscape design strategies for eco-cultural education with an experiential learning approach by taking advantage of the existing forest ecosystem, river ecosystem, and vernacular Malay landscape.

LITERATURE REVIEW

ENVIRONMENTAL EDUCATION

UNESCO (2021) claims that spreading environmental education is one way to achieve the organisation's environmental preservation goals. It refers to both learning used as a tool for growth to enhance the quality of life in human societies and education geared towards protecting and developing the environment. According to the Tbilisi Declaration (1977), environmental education is an approach to learning that cultivates attitudes, motivations, and commitments to act responsibly and broadens people's thinking and understanding of the environment and its problems. It also develops the skills and knowledge necessary to deal with those issues. The Tbilisi Declaration (1977) also emphasises that environmental education utilises a range of teaching and learning techniques, but practical activities and hands-on experience are strongly emphasised.

CULTURAL EDUCATION

Preserving cultural traditions is crucial since it is recognised as one of the most significant factors supporting and defining a society's culture. Looking at cultural heritages around the world, many are threatened by unforeseeable natural occurrences, environmental factors, socioeconomic conditions, and human intervention (Goodarzarparvari & Bueno Camejo, 2018). Numerous studies (Fleer & Robbins, 2007; Bamford, 2006) have explored the need for education to mitigate this risk. Their dedication to conservation would increase as a result of such knowledge.

EXPERIENTIAL LEARNING

In contrast to conventional classroom settings, learners or students in experiential learning situations collaborate and learn from one another in a more semi-structured way. Experiential learning and environmental education aim to improve the lives of the community and the environment, even though they are not practically the same. The alternative, in which education is carefully controlled, may require learners to compete against one another or to stay disengaged or disheartened.

The steps that make up experiential learning are as follows (Haynes, 2007):

1. Doing: Experiencing/Exploring - With minimal to no assistance from the educator.
2. What Happened: Sharing/Reflecting – The outcomes, responses, and observations will be discussed among the learners.
3. What is Important: Processing/Analysing - Learners will talk about, evaluate, and think back on the event.
4. So What: Generalising – The experience will be related to examples from the actual world, trends or universal truths will be found, and principles from "real life" will be identified by the students.
5. Now What: Application - Learners will apply what they gained in the event to a related or dissimilar circumstance, as well as what they learned from prior experiences and practice.

Generally, environmental and cultural education needs experiential learning as a learning medium to gain the community's interest. It will provide more interesting and exciting opportunities for them to gain awareness of the importance of environmental and cultural preservation.

PRECEDENT STUDIES

RIMBA ILMU, UNIVERSITY OF MALAYA, MALAYSIA

Situated on the campus of the University of Malaya is an 80-hectare botanical garden called 'Rimba Ilmu'. The place's name is a literal translation of "Forest of Knowledge" from Malay. Mostly used to educate on botany and plant conservation, this space in the university is open to tourists with a reasonable fee and tour guides. It was once a deserted rubber estate developed as a teaching facility for biology students. When it opened to the public, several activities and events were introduced under the Environmental Education Programme. The environmental education and experiential learning provided are:

1. Tagging and labelling trees (see Figure 3);
2. Botanical art workshops (see Figure 4); and
3. Biodiversity and ecological training.



Figure 3: Trees tagging activity
(Source: Rimba Ilmu, 2017)



Figure 4: Workshops and talks during events
(Source: MASA, 2023)

SEWARD PARK, SEATTLE, UNITED STATES

Located in Seattle, Washington, Seward Park is a city park in the same-named city district spanning 300 acres. The park occupied the entire Bailey Peninsula, which extends into Lake Washington. The name of the park was honoured with the name of Lincoln's Secretary of State, William Seward. The park's potential was discovered in the early 1890s when the Olmsted group created the picturesque centerpiece. The park is now an urban sanctuary for various native plants and animals. The park provides various outdoor experiential learning, and it includes:

1. Exploration of the ancient forest and shores (see Figure 5);
2. Bird spring feeding at their habitats; and
3. School field trip to learn on wildlife species (see Figure 6).



Figure 5: Exploring the ancient forest
(Source: Seward Park, 2023)



Figure 6: Activities during field trip
(Source: Seward Park, 2023)

SITE INTRODUCTION

International Islamic University Malaysia (IIUM) Gombak campus was built around the "Garden of Knowledge and Virtue" concept in 1993. Because of the natural resources in and out of its surroundings that can be seen from Figure 7, including the Pusu River and the waterbodies, along with the natural backdrop of Tabur Hill and greeneries and the existing Rumah Kutai in Figure 8, it is highly probable for the institution to contribute to an educational format called eco-cultural education. Besides that, enhancing the eco-cultural education principles would help protect the rich local biodiversity of the campus and Gombak district.



Figure 7: Nature surrounding IIUM
(Source: Travelog Azam, 2012)



Figure 8: Rumah Kutai
(Source: Zeenat et al., 2021)

RESEARCH METHODOLOGY

To retrieve the data, this study used a mix-methods approach. Document analysis, site investigation and semi-structured interview are categorised as qualitative methods, while survey questionnaire is in both the qualitative and quantitative approaches (see Figure 9). The documents analysed for this study include various topics, including environmental and cultural education, on-campus experiential learning, and various case studies of eco-educational centres in Malaysia. An investigation of the land's natural state was done to determine the possibilities for environmental education using an experiential learning approach. Next, semi-structured interviews with representatives from the IIUM agencies were conducted involving an academician from the Department of Landscape Architecture and an assistant engineer from the Development Division. Finally, the IIUM community's opinions about converting the campus into an Eco-cultural Educational Centre were obtained via a survey questionnaire.

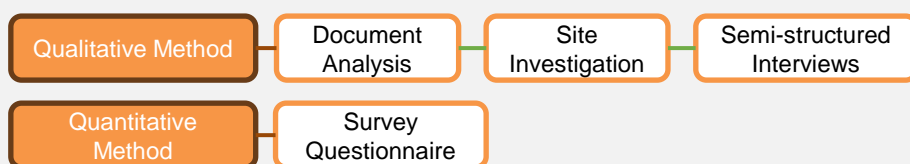


Figure 9: The chart of the research methodology

RESULTS AND DISCUSSIONS

DOCUMENT ANALYSIS

Several pamphlets and brochures on campus grounds that applied experiential learning from three institutions were analysed. Table 1 shows these institutions' different takes on their experiential learning experiences.

Table 1: Examples of campus ground with experiential learning

Higher Institution	Terms Used as Educational Centre	Programmes/Spaces Offered
UKM Pahang	Edu-Tourism @ PPTC (Pusat Penyelidikan Tasik Chini)	1. Tasik Chini Exploration: Indigenous Experience 2. Tasik Chini Exploration: Forest Experience
UPM	eDU-PARK	1. Farm Feed Fun 2. Malay Heritage Museum 3. Gallery Serdang 4. Park Conservatory
UUM	Edu-Tourism – 'The University in a Green Forest'	1. Ostrich and Duck Feeding 2. Deer Park and Horse Care

SITE INVESTIGATION

Several attributes have been observed and assessed through site investigation on the campus ground of IIUM Gombak:

Ecological Attributes

The topography, hydrology, vegetation, wildlife, and microclimate are among the ecological features that are all directly or indirectly related to one another. The IIUM Gombak campus is situated in a valley surrounded by hills (see Figure 10) and made up of several waterbodies, with its water supply coming from three tributaries of the Pusu River, the Batang Pusu River and the Anak Pusu River. After that, the water passes through seven separate retention ponds (see Figure 11). These water bodies can be transformed into outdoor education and recreation places like canoeing, fishing, workshops, and more.



Figure 10: Tabur hill backdrop
(Source: Umor et al., 2018)



Figure 11: One of retention ponds in IIUM
(Source: Noor, 2019)

The varying landforms in IIUM suggest various ecosystems of vegetation and animals. The pedestrian circulation needs to consider these diverse landforms to either be built with a special design or avoid the hilly area. Wildlife found on the property includes the monitor lizard (*Varanus*) (see Figure 13), cobra snake (*Naja naja*), viper snake (*Viperidae*), mousedeer (*Tragulidae*), as well as some bird species, including the swiftlet (*Collocaliini*) (see Figure 14), whose nests were formerly located close to retention pond 1 area but were subsequently ruined.

Different animal species' occurrence rates suggest that the physical environment at the IIUM site has altered, and some wildlife is now less likely to frequent the area than it was previously. Other than that, the forest ecosystem's existing flora naturally flourished there. New plants were planted nearby the built-up areas to soften their visual impact and contrast with the structures' rigidity.

In addition, visitors can relax while taking in the retention pond's tranquil flora and water features. Since they provide picturesque views, the higher-elevation landscapes, particularly the borrowed scenery of Tabur Hill, need to be sustained.

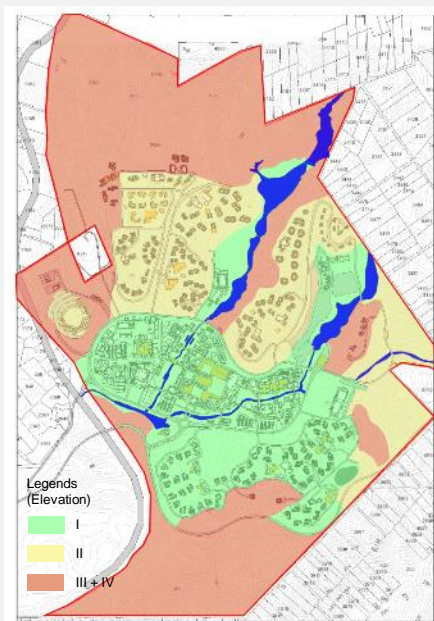


Figure 12: Topography and Hydrology Map



Figure 13: *Varanus* (Source: Butler, 2006)



Figure 14: *Collocaliini* (Source: Petersson, 2019)

Physical Attributes

To better meet the community's requirements, physical characteristics such as circulation and accessibility, outdoor areas, and existing hardscapes were examined. The standard measurement indicates that IIUM's location has adequate dimensions for vehicular traffic. On the other side, there are only a few sites where pedestrian walkways (see Figure 15) have been created while at the same time making them inaccessible to vehicles (see Figure 16). Some have been discovered to be damaged and require maintenance. The circulation and hardscapes of the existing buildings can be designed with a uniform campus identity using the same materials. Additional requirements include the use of appropriate materials for hardscapes and circulation and the designation of various zoning zones.

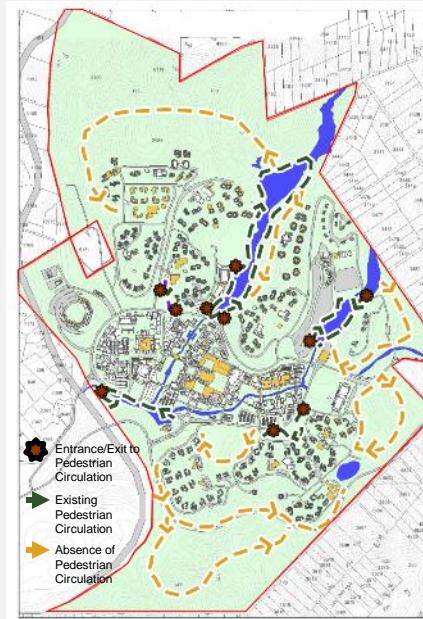


Figure 15: Pedestrian Circulation Map

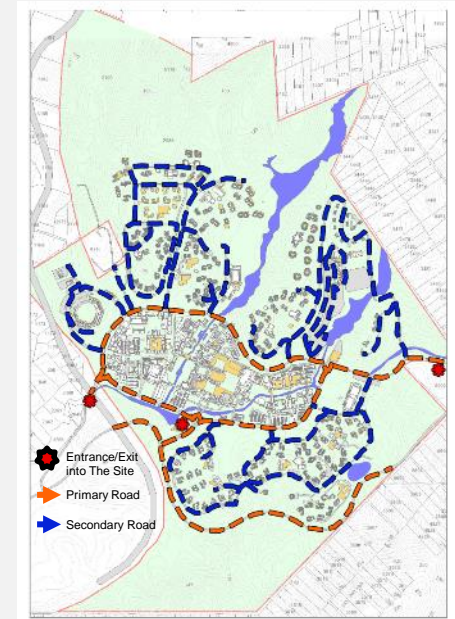


Figure 16: Vehicular Circulation Map

SEMI-STRUCTURED INTERVIEW

This interview aims to learn more about the IIUM Gombak campus's growth trajectory from the beginning and to know their opinion on developing the IIUM Gombak campus into an eco-cultural educational centre. Table 2 shows the areas of the inquiries and the information obtained from the interview sessions.

Table 2: Questions and answers of semi-structured interview

Questions	Answers
1. Is there specific guidelines or management system for the landscape on the IIUM Gombak campus?	<ul style="list-style-type: none"> • IIUM needs to abide by the local authority guidelines during the development of the landscape. • If there is the latest development, the person in charge of the organisations must forward their proposals to the garden evaluation community.
2. Is there any more development plan in IIUM soon?	<ul style="list-style-type: none"> • 65% of the campus ground has been developed, while 35% remaining undeveloped areas are in the planning process, and IIUM has a plan.
3. What is your opinion if IIUM is developing its campus to be an eco-cultural educational?	<ul style="list-style-type: none"> • It would be a great proposal for the university. • The researcher may propose to either change the non-native plants to native plant species on the campus. • Tree tagging can also be done for the whole plant species on the campus ground.

SURVEY QUESTIONNAIRE

The purpose of the survey questionnaire for this project is to discover further how the IIUM community feels about the possibility of developing the IIUM Gombak campus into an eco-cultural educational centre, given its current state. The survey form was distributed via various online channels, including Telegram, WhatsApp, and email messaging services. Thirty-three respondents—all IIUM undergraduate students—provided their responses to the survey. Seven respondents shared their suggestions for the eco-cultural educational centre in Table 3.

The survey questionnaire was conducted to identify opportunities for environmental and cultural education (objective number 2). It contained four parts. Part 1 of the survey questionnaire was developed to identifying the respondents' information; Part 2 was to find out the respondents' general knowledge regarding environmental education; Part 3 focused on the respondents' perspective on the benefits of environmental education with a total of eight (8) statements; and lastly, Part 4 was to gain the point of view of the respondents regarding the suitability of developing IIUM Gombak campus for the eco-cultural educational centre.

Table 3: Summary of questions asked in part 1

Statements	Number of Respondent					
	19	20	21	22	23	24
Age	6	4	5	12	5	1
Gender	Female			Male		
	24			9		
Kulliyah	KAED	HS	IRK	KOED	KICT	KOE
	17	7	3	3	2	1
Mahallah	Female Mahallah		Male Mahallah		None	
	19		9		5	

For Part 2, majority of the respondents have involved with more than two Environmental Education Programme (EEP) such as planting trees, trips to parks or gardens and volunteering for activities related to nature.

Table 4: 3 out of 8 statements in the part 3 of the questionnaire

Statements	Likert Scales (Number of Respondent)				
	1	2	3	4	5
Environmental Education helps learners see the interconnectedness of social, ecological, economic, cultural, and political issues.	0	1	4	17	11
With Environmental Education, critical and creative thinking skills are enhanced.	0	1	2	19	11
Environmental Education promotes tolerance of different points of view and different cultures.	0	2	3	16	12

Table 5: Summary of part 4

Statements	Summary
Which of this river ecosystem is suitable for the development of the Environmental Education Centre?	The majority of the respondents select retention ponds 1 and 2 out of the seven retention ponds since it is the most frequent spots compared to the others.
Which of this forest ecosystem is suitable for the development of the Environmental Education Centre?	The majority of respondents, on average, selected zone A and D as the two forest areas best suited for eco-cultural educational centre since they are the easiest for them to access.
Is the Zone A site suitable for the development of the Environmental Education Centre?	30 respondents out of 33 agree that the area of Rumah Kutai is suitable for the development of eco-cultural educational centre.
Which of these green area spaces are suitable for the development of the Environmental Education Centre?	According to data, the majority of responders select just one zone, with zone A receiving the most votes.

Table 6: Suggestions by the IIUM students for eco-cultural educational centre

Respondents	Answers
R1	I suggest the IIUM community be more exposed to environmental education, especially regarding the river ecosystem. The river flowing within IIUM is getting more polluted due to some external factor outside of the university's control. However, actions can be taken, such as conducting a river-cleaning program and instilling awareness among the IIUM community not to pollute the river further.
R2	Organise educational camp inside IIUM.
R3	Clear the river, separate it from sewage and bad smell.
R4	Plogging activities would be fun for all ages.
R5	Educational Hub, Landscape/Herbarium Gallery.
R6	River clean campaign once a month.
R7	Increase environmental programs such as edible gardens, tree planting and river of life that encourage the involvement of IIUM students and students from outside.

It can be concluded that the IIUM Gombak campus has the opportunities and capabilities to be developed into an eco-cultural educational centre. Several suitable outdoor spaces have been identified for different education purposes that can be classified based on their education types.

RESEARCH FINDINGS

Several syntheses are developed based on research conducted on the IIUM Gombak campus's natural resources. The following proposals are meant to create awareness among the community, top management, important stakeholders, authorities, and others. Three different education types have been categorised: river ecosystem education, forest ecosystem education and Malay vernacular education. Figure 17 shows the potential spaces suitable for each education type.

1. Conserving River Ecosystem

1. Enhance the maintenance system of the waterbodies.
2. Implement ecological water filtration through phytoremediation plants.
3. Provide assembly spaces for water recreational activities that only minimally impact the water.
4. Create several wooden decks for kayaking activities.

2. Reconnecting with Forest

1. Provide dark sky education areas in the forest ecosystem for users to experience the natural flora and fauna habitats during the night.
2. Educational trails are to be included in the forest area with ecological information related to the sites, along with several informative stops.
3. Pinpoint the area on which the birds and wildlife are mostly frequented.
4. Create spaces for bird watching and learning about wildlife species.

3. Embracing Malay Vernacular Landscape

1. Create spaces for native rare fruit tree orchards.
2. Enhance the Malay vernacular landscape to deepen the community's knowledge of the topic.
3. Provide a kitchen garden space for the users to experience the comprehensive process from sowing the seeds to using the harvested products as cooking ingredients.
4. Create an outdoor cooking workshop space with structures based on a traditional Malay house.



Figure 17: Research Findings Map

MASTERPLAN DEVELOPMENT PHASE

The project aims to develop a landscape masterplan of an Eco-Cultural Educational Centre on the IIUM Gombak campus through environmental preservation and nature-based experiential learning with the following objectives:

1. To develop the river ecosystem as an outdoor educational area that can help with river conservation;
2. To develop the forest ecosystem that provides nature-based recreational spaces through low-impact design (LID); and
3. To propose a vernacular landscape environment with experiential learning on Malay culture and native rare fruit trees.

DESIGN AND PLANTING CONCEPT

Chain of Virtue serves as the project's design concept. The design idea was originally inspired by the IIUM's slogan, "Garden of Knowledge and Virtue," which refers to literal and abstract elements. Morality and wisdom are the garden's products. The Chain of Virtue implies creating a comprehensive connecting centre that enhances virtue within the users. The implementation focuses on the environment's holistic nature that is naturally connected with other elements. The virtues intended to be provided to the community are forest ecosystem education, river ecosystem education, and Malay vernacular education, which are integrated with experiential learning.

The planting concept, **Chain of The Tropical**, is a concept that intends to bring out the continuity of tropical trees, which are also native to the country, across the campus. Examples of planting selection are in Figure 18, Figure 19, Figure 20, and Figure 21.

1. The majority are native species.
2. Continuity from the design concept.
3. Introduce more underrated native plants.
4. Preserve the identity of the country.
5. Increase the biodiversity of the area.
6. Provide shade and calmness to the users.
7. Edible plants can increase the self-produced value.



Figure 18: *Alstonia angustiloba* (Source: National Parks, 2021)



Figure 19: *Cynometra cauliflora* (Source: Ahmad, 2011)



Figure 20: *Morinda citrifolia* (Source: Kebun Bandar, 2018)



Figure 21: *Persicaria odorata* (Source: Kilham, 2017)

The bubble diagram in Figure 22 represents the generated ideas – a process to develop the eco-cultural educational centre. Blue represents river ecosystem education, green represents forest ecosystem education, and yellow represents Malay vernacular education. The ideas are generated through elements comprised in each of the education types, experiential learning activities that can be done related to the elements, and the spaces required for the activities to be held.

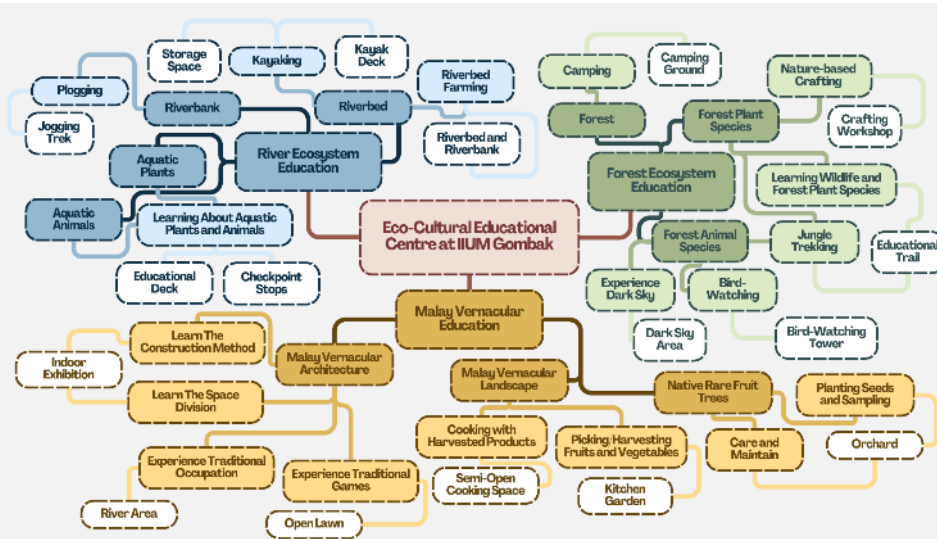


Figure 22: Bubble Diagram: Development of Design Ideas

Figure 23 shows the overall map of the campus and where each of the education types is located. Functional diagrams in Figure 24, Figure 25 and Figure 26 on each of the education types were also generated to show how each spaces function as outdoor educational space.

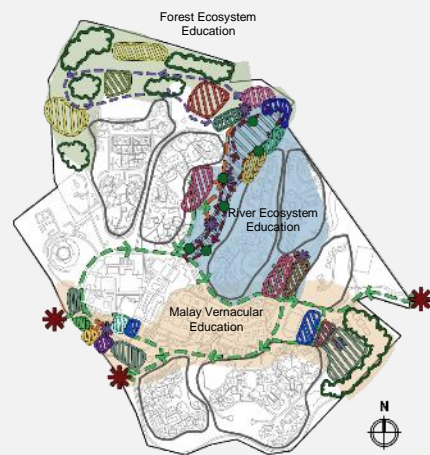


Figure 23: Space Programming Diagram



Figure 24: Functional Diagram – River Ecosystem Education

Table 7: River Ecosystem Education Space Division

Space	Activity (E.L.)	What to Learn Here
"Planting at Riverbed and Riverbank!"	- Riverbank Planting - Seasonal Riverbed Planting - Harvesting Crops	- Learn the importance of riverbed and riverbank. - Learn plant species that can be planted at riverbed.
"Kindness in Jogging"	- Plogging	- Learn the importance of cleanliness along the river. - Learn the effect of rubbish and toxic chemicals to the water.
"Learning By The River"	- Nature Crafting Using Water-themed materials	- Learn the importance of aquatic plants and animals.
"Let's Kayak!"	- Solo-Kayaking	- Learn the importance of low-impact recreational activities. - Learn how recreational activities may damage the water.

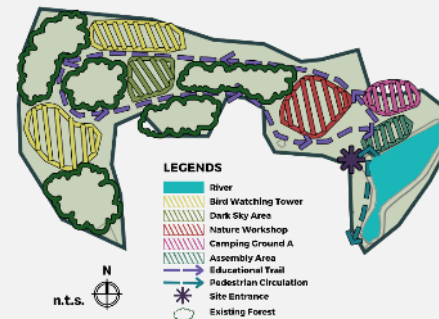


Figure 25: Functional Diagram – Forest Ecosystem Education

Table 8: Forest Ecosystem Education Space Division

Space	Activity (E.L.)	What to Learn Here
"Forest Adventure"	- Jungle Trekking - Seasonal Trees Tagging	- Learn wildlife species in IIUM. - Learn forest plant species in the IIUM forest.
"Bird-Watching in The Wild"	- Bird-watching	- Learn bird species in IIUM.
"Crafting with Nature"	- Nature-themed Crafting	- Learn to recycle materials properly.
"Dark Sky Area"	- Experience Dark Sky	- Learn the importance of dark sky area.



Table 9: Malay Vernacular Education Space Division

Space	Activity (E.L.)	What to Learn Here
"Kitchen Garden Coming!"	- Planting Seedlings and Saplings	- Learn the edible plants such as herbs, fruits and vegetable species.
"Oh My Orchard!"	- Harvesting Native Rare Fruit Trees	- Learn the native rare fruit trees species.
"Rumah Kutai"	- Play Traditional Games	- Experience the traditional culture of Malay.
"Mom Homemade Cook"	- Cooking Using Harvested Products	- Learn the importance of preserving traditional dishes with traditional cooking methods.

Figure 26: Functional Diagram – Malay Vernacular Education



Figure 27: Functional Diagram – Circulation and Accessibility

Following the schematic plan (see Figure 28), a preliminary masterplan (see Figure 29) was created to develop a comprehensive designed landscape masterplan (see Figure 30) that showed the design form of the spaces within the site for the Eco-Cultural Educational Centre.

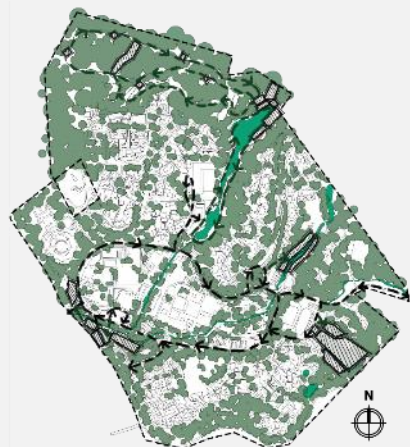


Figure 28: Schematic Plan showing the layout development process for the masterplan



Figure 29: Preliminary Masterplan – A process towards finalizing the masterplan

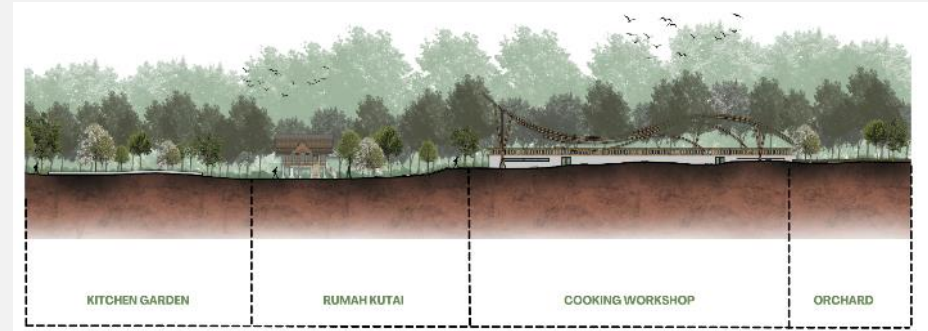


Figure 31: Section A-A'

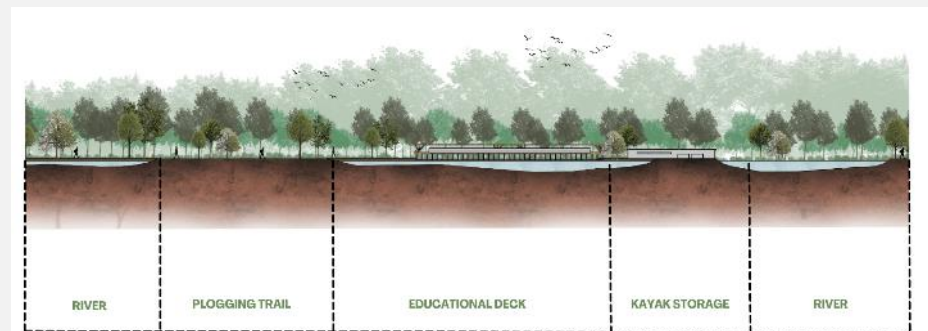


Figure 32: Section B-B'

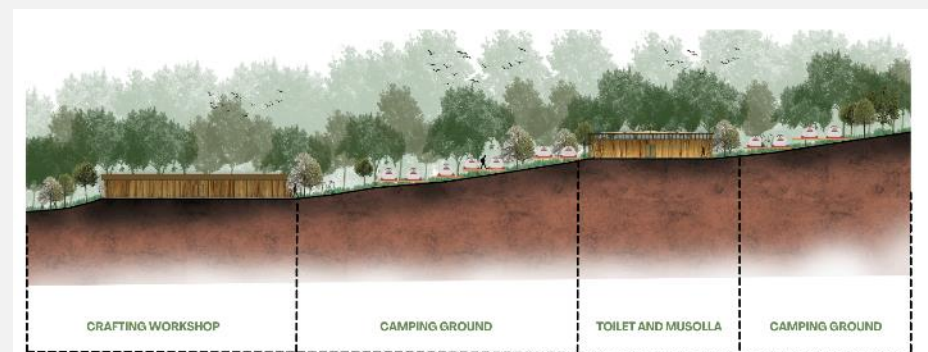


Figure 33: Section C-C'

Several sections of different spaces were created to show the landscape design on the landform of the site. It also explains the details of the structures being built, such as the cooking workshop for Malay vernacular education (see Figure 31), educational deck for river ecosystem education (see Figure 32) and crafting workshop for forest ecosystem education (see Figure 33).

DETAILED DEVELOPMENT PLAN PHASE

DESIGN AIM AND OBJECTIVES

This proposed plan aims to propose a detailed development plan of a Malay vernacular landscape environment with experiential learning on Malay ecology and its surrounding with the following objectives:

1. To introduce the Malay heritage through spaces that consist of functional and well-designed outdoor spaces; and
2. To enhance the Rumah Kutai landscape compounds for users to experience the traditional Malay lifestyle.



Figure 30: Proposed Landscape Masterplan

DESIGN AND PLANTING CONCEPT

Although the design concept for the detailed development plan is identical to the masterplan's, which is the 'Chain of Virtue', the design focuses more on the virtues of Malay vernacular education, which is integrated with experiential learning.

The planting concept applied for the detailed development plan was the same as the masterplan's planting concept, 'The Chain of Tropical'. Some of the proposed plants were *Cynometra cauliflora* (NamNam tree), *Phyllanthus acidus* (Cermai tree), *Morinda citrifolia* (Nona tree), *Cosmos caudatus* (Ulam Raja), *Persicaria odorata* (Kesum), and *Citrus hystrix* (Limau Purut).

BUBBLE DIAGRAM

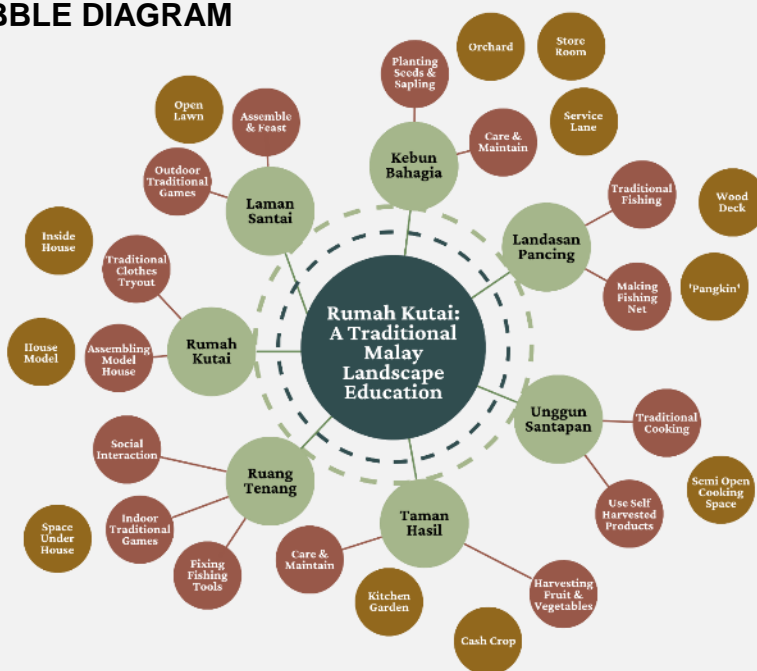


Figure 34: Bubble Diagram for Detailed Development Plan

FUNCTIONAL DIAGRAMS



Figure 35: Functional Diagram – Spaces Zoning

- Open lawn is a free green space that is mainly for community spaces.
- Kitchen garden and cash crop areas are for the users to learn the importance of domestic raw food supplies.
- The traditional Malay house is a climate-friendly house (bioclimatic design) as it has a good ventilation system and uses materials that give a cooling effect to the users.
- Space under the house is often used for passive and active activities.

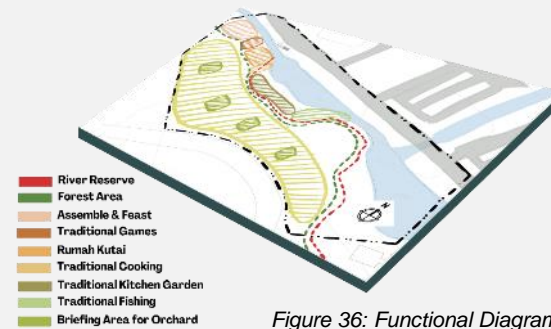


Figure 36: Functional Diagram – Educational Activities

- Care for and maintain for kitchen garden.
- Learn how to sew and fix fishing net.
- Harvest fruits from the native rare fruit trees orchard.
- Traditional dishes cooking activity.
- Learn and assemble a miniature of Rumah Kutai.

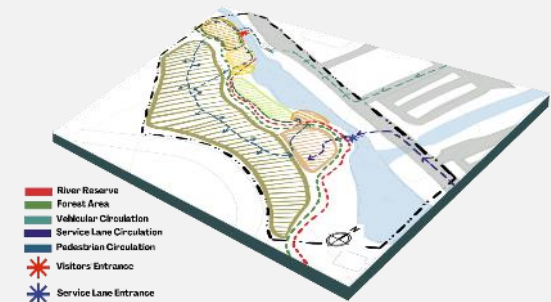


Figure 37: Functional Diagram – Circulation and Accessibility

- A service lane is provided for service vehicular circulation around the area.
- There is only pedestrian circulation for visitors inside the area.
- The main entrance is located in front of the open lawn.



Figure 38: Functional Diagram – Planting Design

- Native plants align with the tropical identity of the country.
- Fruit trees, herbs and vegetables to teach users the importance of raw food supply.

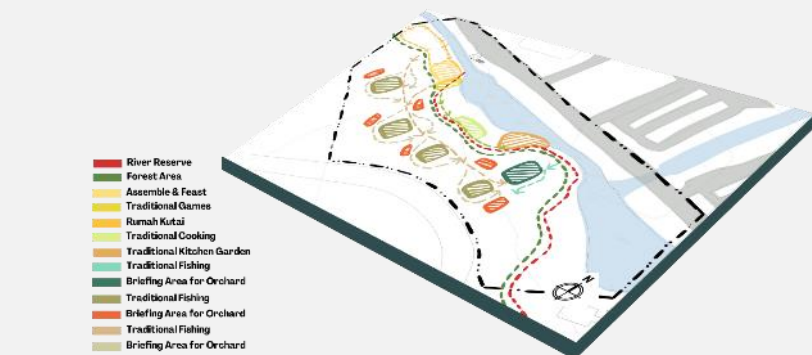


Figure 39: Functional Diagram – Hardscape Ideas

Creating a detailed development plan was followed by a schematic plan (see Figure 40) and a preliminary masterplan (see Figure 41). A complete detailed development plan (see Figure 42) shows the design of the spaces in the area for the Eco-Cultural Educational Centre at Rumah Kutai. It was then supported by several section drawings and 3D perspective views in Figure 43 and Figure 44.



Figure 40: Schematic Plan

Figure 41: Preliminary Plan



Figure 42: Detailed Development Plan



Figure 43: Section and 3D view of river area

- **Landasan Pancing:** A wood deck beside the river for the users to experience the traditional Malay method of fishing while learning about aquatic plants and animals.
- **Taman Hasil:** A small kitchen garden comprises of local vegetable plants and cash crops that will be used for the cooking session at Unggun Santapan.
- **Rumah Kutai:** A traditional Perak house that provide users with several experiences of the traditional Malay lifestyle.
- **Kebun Bahagia:** A native rare fruit trees orchard that provides a lifetime experience of learning and harvesting fruit trees, which are less known nowadays.



Figure 44: Section and 3D view of Rumah Kutai and the orchard

Softscape palette (see Figure 45) and hardscape palette (see Figure 46), along with innovative design elements (see Figure 47) were proposed that align with the concept of traditional Malay house and the planting concept. Auto-rotating composting bin was designed for innovative design elements.

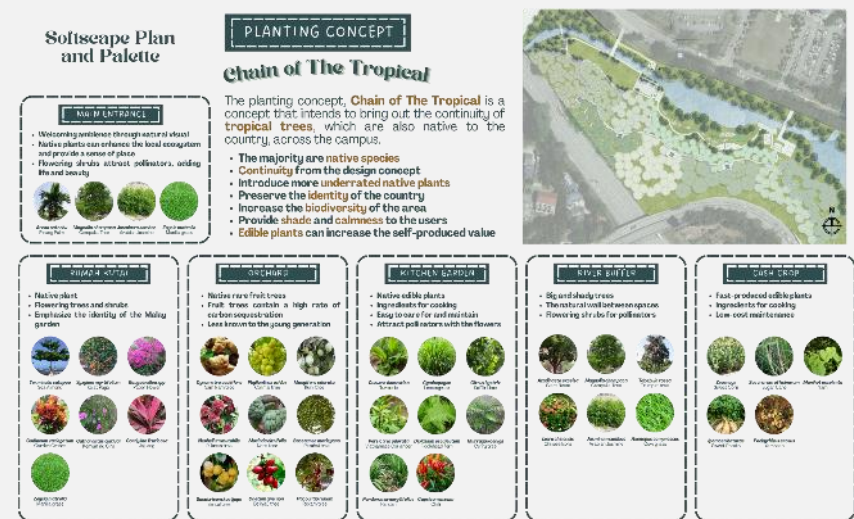


Figure 45: Proposed softscape palette

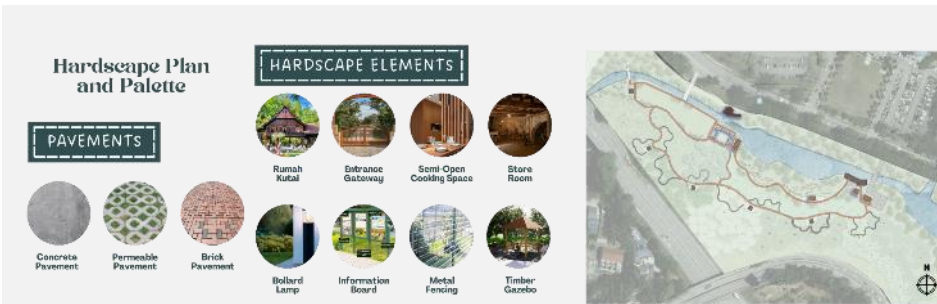


Figure 46: Proposed hardscape palette

INNOVATIVE DESIGN ELEMENT

'Auto-Rotating Composting Bin'

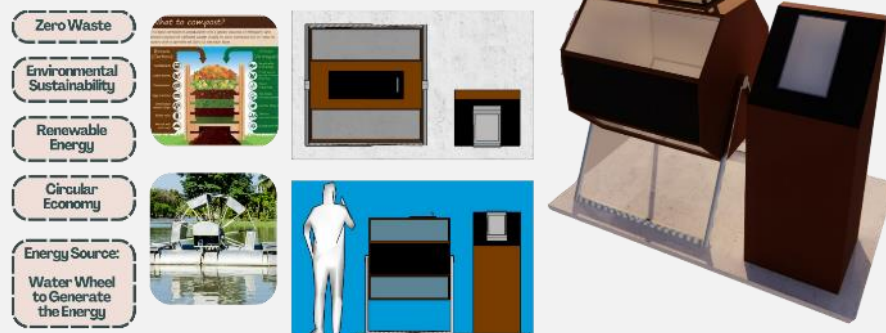


Figure 47: Innovative design element

- A composting bin for brown waste (dry leaves, wood chips, and branches) and green waste (grass clippings, food scraps, and manure).
- The machine will auto-rotate daily, and the compost can be used by the second week.
- Reduce brown waste and green waste.
- Teach users to reuse organic materials around them.
- Compost for orchard and kitchen garden.

CONCLUSION

This research concludes that the IIUM Gombak campus has great potential to be developed into an Eco-Cultural Educational Centre with a proper design implementation that will sustain the existing resources of the site. With the assistance of local authority and the campus's management, it will benefit the community to obtain more knowledge on environmental and cultural education through experiential learning.

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