

**PROPOSED CAMPUS LANDSCAPE DESIGN FOR FSA
ADMINISTRATION BUILDING**

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**PERPUSTAKAAN
UNIVERSITI MALAYSIA SABAH**

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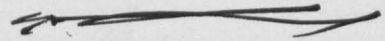
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DECLARATION

I hereby declare that this dissertation is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that no part of this dissertation has been previously or concurrently submitted for a degree at this or any other university.



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ABSTRACT

This study aims to propose the restorative landscape in campus for restoration capacity of student's attention and being healthy. The objectives of this study are to conduct site inventory and analysis at proposed site; to propose restorative landscape design by using tropical plant material for the site of administration building area and to conduct questionnaire survey to gain feedback on the landscape design from the stakeholders. The data collection will be 1. Questionnaire survey 2. Descriptive statistical analysis 3. Landscape design recommendation, which get the feedback from stakeholder. These data collection involved the participation of 60 students in campus. Based on the findings, the existing landscape at Administration Building of Faculty Sustainable Agriculture can be improved to offer aesthetic view and restorative landscape in campus for reducing tension from academic activities. The proposed site was divided into four zones namely Zone A, Zone B, Zone C and Zone D. Master plan, perspective views of zones and planting material were produced in landscape design recommendation after data collection of study. In conclusion, the vegetation and water bodies could promote a sense of being away from daily workout.

ABSTRAK

TAMAN LINDUNGAN- MODEL LANDSKAP KAMPUS PEMULIHAN DI KAWASAN TROPIKA

Kajian ini bertujuan untuk mencadangkan landskap pemulihan di kampus untuk meningkatkan kapasiti pemulihan perhatian dalam kalangan pelajar dan menjadi lebih sihat. Objektif kajian ini adalah untuk menjalankan inventori tapak dan analisis di tapak cadangan; untuk mencadangkan reka bentuk landskap pemulihan dengan menggunakan bahan tumbuhan tropika di tapak kawasan pejabat am dan visi soal selidik dijalankan untuk mendapatkan maklum balas dari pihak berkenaan untuk mengenai reka bentuk landskap. Pengumpulan data akan merangkumi 1. Soal selidik 2. deskriptif statistik analisis 3. Landskap reka bentuk cadangan, yang mendapat maklum balas daripada pihak berkepentingan. Pengumpulan data telah melibatkan penyertaan 60 orang pelajar di kampus. Berdasarkan maklumat kajian, landskap yang sedia ada di Pejabat am Fakulti Pertanian Lestari boleh ditambahbaikkkan untuk menawarkan penampilan dan landskap pemulihan agar dapat mengurangkan tekanan dari kerja. Tapak cadangan telah dibahagikan kepada empat zon iaitu Zon A, Zon B, Zon C dan Zon D. Pelan induk , pandangan perspektif setiap zon and penanaman telah dihasilkan dalam cadangan reka bentuk landskap selepas mengumpul semua data. Kesimpulannya, pokok dan elemen air dapat menawarkan perasaan jauh dari tekanan kerja seharian.

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CHAPTER 1

Introduction

1.0 Background

The concern of healthy environment has recently increasing and discussing in global where most of the people wish to live. This same goes to the environment of campus, a campus surrounded by attractive landscape is an inspiration to all students, lecturers, school employees and all residents. Restorative landscape is one of the common way to provide a space where emphasises human "healing" through exposure to nature. Therefore, many people seek out nature in time for reducing stress. A study found that green space in living environment had a significant relation to perceived general health in all elderly, youth and secondary educated people (Maas at al., 2006) The potential health value of greenspace has been regarded as important in urban planning where there provides health benefits to living and workplace in public green areas (Lachowycz and Jones, 2013). The numerous studies proved the interaction with natural space offers positive effect on mental and physical health (Lachowycz & Jones, 2013) This is because there are some positive impacts in human health such as has fewer health problems, increased feelings of general health, lower levels of stress and faster recovery from illness by spending more time in natural space (Clark at el., 2014).

Present research proved that restorative landscape provided a positive relationship between natural views and the capacity to direct attention (Berto, 2005). Mental fatigue is occurs when the capacity to direct attentions is reduced and sustained mental effort. Restorative environment has four factors, such as being away, extent, fascination and compatibility which could reduce the directed attention fatigue (Kaplan and Kaplan 1989). Moreover, the implemented restorative landscape could increase the aesthetic value of campus.

The most widely practiced ways of obtaining relief from stress or depression in modern society are going into nature. Furthermore, a conducive landscape within natural element



in learning environment could provide benefit experience on students' mental stability, reduce stress in academic and improve their health mental by interacting with nature (Mohamed et al., 2014). Therefore, restorative environment offers stress-relieving effects of nature with the use of landscape to provide fascination of the environment to can help people regain their energy and attention capacity after a long, mentally-fatiguing work by the end of the day.

Restorative campus landscape has been proposed in this research to promote health and well-being of the community of campus. The potential site for this study is the Administrative Building area which is accessible within a short walking distance. A study found that student's attention capacity could be restore by spending time in nature during study break (Felsten, 2009). Student-nature interaction, the student enables to relieve stress, promote their health and well-being. Therefore, student will have the opportunity to be away from daily hassles and obligations which allow them to restore their energy and focus on improving their academic performance. This study will highlight the use of tropical plant species as the main element of restorative campus landscape

1.1 Problem Statement and Justification:

Currently, the lack of landscape facilities in FSA has inhibited the community from enjoying the outdoor environment within the campus vicinity has the potential to encourage socialisation among the community. According to Kenney and Dumont (2005), the feeling of the community on college campuses has declined, as students often maintain busy lives and a loner- lifestyle. The landscape elements such as plant material can improve health and well-being of the students besides improving the overall landscape of the campus. The study shows that vegetation in learning environment provides positive effect on students which help them to increase positive feeling, reduces academic stress and negative feeling even enhance their attention in learning (Han, 2009). Thus, the aim of this research is to propose a series of green garden which will link the open spaces around the administration building area. The concept of restorative environment will be introduced in the design of green gardens.

1.2 Objectives:

The objectives of this research are:

- a. To conduct site inventory and analysis at the proposed site (Administration Building area)
- b. To propose restorative landscape design by using tropical plant materials
- c. To conduct questionnaire survey to gain feedback on the landscape design from the stakeholders.

CHAPTER 2

Literature Review

A well-designed campus helps conserve the environment and creates a learning environment that stimulates improved teaching and learning. It also will serve a well-structured places for circulation, access, socializing, recreation and gathering. The ideal campus landscape should be designed into green environment that creates potential for intellectual and social exchange. There are several principle as guideline in landscape designing which are the uses, connection to place, the experience of nature, ecosystem benefits, appropriateness, aesthetic value and efficient management. With these principles, the planning and design of campus landscape will maximize the opportunity of restoration landscape campus in order to relief from stress and well- being of students.

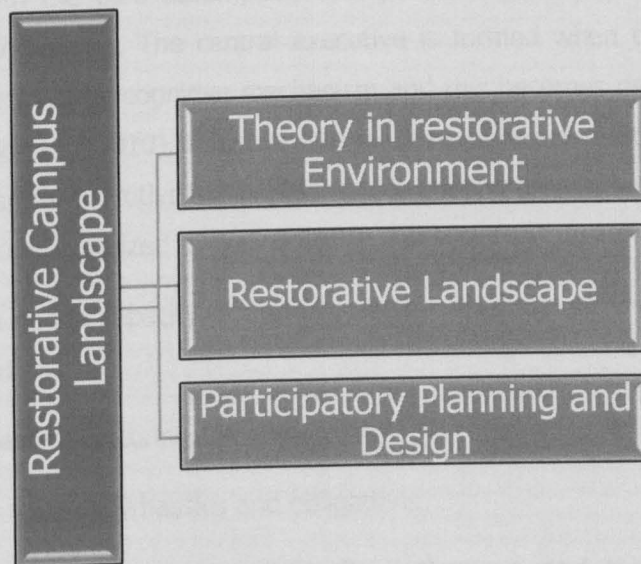


Figure 2.0: Literature Map

2.1 Theory in Restorative Environment

Restoration is a term that refers to the experience of psychological and psychological recovery process that is caused by environmental configuration. There are two theoretical explanation in research of restorative environment, which are stress recovery theory and attention restoration theory. Even though both are related in restoration of environment, but each theory has different explanation and prospect towards restorative environment. Attention restoration theory focuses on the restoration from attentional fatigue which leading to mentally fatiguing over a longer time. Whereas, stress recovery theory focuses on restoration from stress which individual is facing the threatening to well-being.

2.1.1 Attention Restorative Theory

Attention restoration theory emphasize the importance of slower, cognitive mechanisms in restoration with the core assumption that people have limited capacity to direct their attention to something. The central executive is formed when the competing stimuli is inhibited or blocked by cognitive mechanism and this becomes depleted over a long time (Kaplan and Berman, 2010). However, the resulting of directed attentional fatigue (DAF) is depletion of central executive mechanism, which encountered based on human-environment relationship is characterized by four qualities, i.e.

- a. Fascination or the capacity of an environment to automatically draw attention without cognitive effort.
- b. a sense of extent or connectedness
- c. being away from daily hassles and obligations
- d. compatibility between the individual's inclinations and the characteristics of the environment .

Due to the combination of these four qualities in human environment relationship which increase the effectiveness of countering the DAF than most built settings in environment.

Thus, Attention restoration theory more emphasize on the being away from daily schedule workout and go for slower mechanism compare to SRT.

2.1.2 Stress Reduction Theory

Stress reduction theory is a theory that consider restoration as a quick, affect driven process. This statement had been proved based on the work of Zajonc (1980), he argued that the generalized effect dislike and like towards environment is initial response of people without conscious recognition or processing of the environment. The initial positive affective responses come about when the specific mental features in environment such as vegetation with more structural features like complexity, gross structural features, depth, spatiality cues, an even ground surface texture, deflected vista and absence of threats. The restorative process is initiated by providing a breather from stress, reducing levels of arousal and negative feelings due to the quick positives affective responses to those features. Therefore, stress reduction theory emphasize on the quick restoration and affect driven process.

2.1.3 Benefits of being in Nature

Past research had stated the dealing with power of nature to give visitors a restful experiences in 1983. This restful experience helped visitor to achieve a quick and strong recovery from stress. A new findings show positive influences on post-operative recovery by having a view of exposing towards nature and green open space through hospital window after a year (Ulrich 1984). Therefore, a lot of new scientific finding had proved the being nature could helped in recovery from stress. Furthermore, in epidemiological studies have consistently indicated the relationship between green space and health are stronger for groups who tend to spend more time in and near their homes in terms of elderly, housewives and people with low socio-economic status. However, the inequality of health between different socio-economic groups are reduced by the availability of green space. Therefore, from the study, the access to green space or nature could protect the low socio-economic people from the negative health consequences.

There is some research data proved that natural environment are more restorative than urban environments. For example, a research is conducted to compare the score test between less natural views from their window and more natural views in their window among the university students. (Tennessen, Cimprich, 1995) However, those with more natural views scored better on test because of the higher effectiveness in directed attention and related their attentional functioning. The capacity to direct attention was measured using battery of objective (Forward and Backward Digit Span test, the symbol Digit Modalities Test, the Necker Cube Pattern control test) and subjective tests (Attentional Function Index) (Berto, 2005).

In addition, the positive linkage nature to health as there are several mechanism that in this relationship such as 1. Improvement in air quality, 2. Stimulation of physical activity, 3. Facilitation of social cohesion and 4. Restoration from stress and fatigue. Both relationship are very essential in urban planning now as urban area is getting less green space.

These previous research theories and empirical findings suggest that nature has a profoundly positive impact on human well-being and social behavior and promote further experience of outdoor green environments throughout daily livings. Such evidence therefore guides and informs restoratives landscape design, the forthcoming section

2.2 Restorative Landscape

2.2.1 Definition

Restorative landscape is the umbrella term which emphasizes human "healing" through exposure to nature in landscape design. The term healing is defined as a natural process. Healing goes deeper than curing and must always come from within. Thus, healing involves "becoming whole". Whereas, the restorative term is referred to an improvement of human well-being, such as stress relief. This type of restorative landscape related to the interaction and relationship between people and their surrounding environment which including the sense of place and cultural amenity.

2.2.2 Characteristic of Restorative Landscape

In Attention restoration theory (ART), these characteristic of restorative landscape are fascination, extent, being away and compatibility which different environments that improve people's directed- attention capacity. (Kaplan, 1989).

a. Fascination or the capacity of an environment to automatically draw attention without cognitive effort.

Fascination is a quality of restorative environment which draw on involuntary attention and consist mainly of fascinating elements. And, these elements occur in a variety of settings and situations that people find interesting and wander more about this place For example, the attractive of variance variety of vegetation, seating area, smelling the fragrance of flower, the sound of water flow could attract the attention of people without cognitive effort. These activities help in restoration of attention and feeling relax even forget about the mental exhausted.

b. a sense of extent or connectedness

Extent exists in an environment that is rich in content and create a sense of willing want to extend in this place. This characteristic should provide enough to see, experience, explore and think about resting either physically or mentally. The example of extent characteristic of landscape is Japanese garden, which promote the sense of extent at that place.

c. being away from daily hassles and obligations.

Being away is the term that people usually to get away and escape with things that trigger our minds. Being away can be under through psychological where empty the mind or physical such as taking a walk in courtyard during break time. And, this does not require a change in position just change in mental content which get away from the things that causing stress.

d. compatibility between the individual's inclinations and the characteristics of the environment .

Compatibility is another characteristic of restorative landscape. Compatibility occurs when the setting fits with the individual's inclinations. But, the settings of compatibility are complex because the characteristic of environment may compatible for certain people and incompatible for others.

2.2.3 Elements of Restorative Landscape

Restorative landscapes require careful consideration of its users. Designer must be aware of the "feeling" that is imposed by space (Barnes et al. 1999). It is the most crucial aspect. Because of this, there are several design approaches, traditional, botanical and people-oriented, that are typical of restorative landscapes (Barnes et al. 1999).

First of all, there are four informational factors, coherence, complexity, legibility and mystery in perception of image (framework). These factors help people to understand their surrounding as well and find the potential exploration. Thus, these factors act as guide to create a potential design to restorative landscape.

- I Coherence: A setting that is orderly and organized into clear areas so that people can easily see and make sense of a place.
- II Complexity: A rich setting with many opportunities for sensory engagement. A coherent setting can and should be complex. Richness or variety within a scene promotes exploration. For example, a garden can have a clear layout but rich with varieties of shrub, tree and flowers, seating area promotes the feeling of wander.
- III Legibility: the level of distinctiveness that a scene possesses. A legible scene has identifiable components, such as landmarks that help with wayfinding.
- IV Mystery: the suggestive quality of a scene that infers that there is more to see. Curved paths and obstructed views are common in a scene with mystery.

Moreover, the selection of appropriate plant and placement in landscape design management. The principle of “the right plant in the right place” can prevent many common problems associated with landscapes and reduce the maintenance requirements (Denny & Hansen, 2016). The factor of selecting appropriate plant is influenced by its function, aesthetics and environment considerations. Therefore, the site inventory and analysis is helpful as guide plant choices by asking what environmental condition existing at the site. By installing suitable plant in landscape design, landscape could reduce the temperature of the environment surrounding the school. This is because of the photosynthesis process of plant which produce oxygen and taking in carbon dioxide that is released in the air.

2.2.4 Restorative design

Restorative landscapes require careful consideration of its users. Designer must be aware of the “feeling” that is imposed by space (Barnes et al. 1999). It is the most crucial aspect. Because of this, the design consideration can be divided into several part in restorative design.

I The design consideration for social support

Restorative Landscape either in gardens and public parks have been documented as place that facilitate social interaction. This is because the public parks has the seating area where the people is usually to hang out and talk to each other. The design consideration also has to consider all citizen including the old citizen and disabilities where they can enjoy the socializing same as others. Therefore, the design for social support must including the area for privacy and locating gardens near gathering areas such as cafeteria (Marcus and Sachs, 2014)

II Design consideration for physical exercise

The physical and emotional benefits of exercise important in restorative design consideration where the motivation for a people to get out from the indoor. Therefore, the outdoor gym facilities could attract young people even old citizen to take an exercise. The places for games such as playground, ball court and miniature golf course provide more structured opportunities for exercise as well as social interaction.

III Design consideration for Natural distractions

The design consideration of natural distractions are very important which could promote an improved emotional state for people to block the worrisome thought, reduce the blood pressure level and stress hormone (Ulrich, 1999). In healthcare environment where situations and procedures are often stressful, frightening or painful, the positive distraction could reduce these kind of problem through connect with nature.

2.2.5 Case studies: Restorative Landscape in Higher Education Institution

A school surrounded by an attractive landscape is an inspiration to all students, teachers, school employees and the parents. The function of landscape at schools are not just to beautify the surrounding but it should also assist the students' learning process and to encourage them to love and appreciate the environment. This is because schools are social institutions, and they play a significant role in educate students to change their mindset and their level of intellectuality even changing their lifestyles.

The following case studies are examples of restorative spaces on college campuses.

I Jessica's Labyrinth, Chatham University, Pittsburgh, Pennsylvania

Jessica's Labyrinth was designed by a third year Landscape Architecture graduate student who won the landscaping design competition in January 2008. The labyrinth is hidden behind flora and is at eye level so the feeling of discovery of labyrinth is created. Labyrinths have been used in landscape design throughout the world. When a person is walking in this labyrinth, he will focus on the direction of labyrinth until he is away from the mentally exhausted.

The design qualities of this outdoor space use all four characteristics of restorative spaces (quiet fascination, wandering in small spaces, separation from distraction and wood, stone and old) as described by Kaplan (1998).

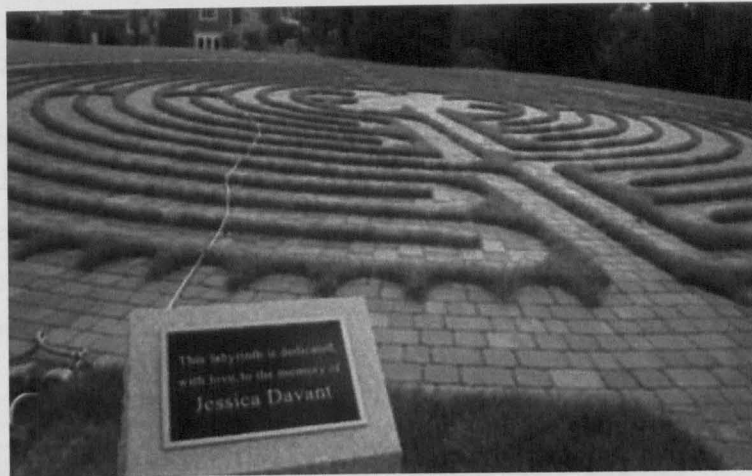


Figure 2.1 The labyrinth in Chantham University.
Source: Google Image, 2017.

II University of Virginia Charlottesville, Virginia, Pavilion Gardens

The pavilion gardens at University of Virginia which was named a UNESCO World Heritage Site in 1987. The garden designs are diverse, ranging from Renaissance-derived formal elements to naturalistic designs typical of 18th-century English parks and incorporated trees, shrubs, and herbaceous borders planted with exotic varietal, native species and plants (Figure 2.2 Shown). The four characteristic of restorative outdoor spaces (quiet fascination, wandering in small spaces, separation from distraction and wood, stone and old) are used in this garden design which is fascinating draw attention of people to connect with nature.



Figure 2.2 The Pavilion Gardens in University Virginia Charlottesville
Source: Google Image, 2017.

III Carleton College Northfied, MN Japanese Garden

Carleton College's Japanese Garden is named as one of the 50 best meditation spaces. This Japanese garden, Jo-ryo-en (the "Garden of Quiet Listening"), is located behind Watson Hall. It was designed in 1974 by David Slawson, and is frequently recognized as one of the best Japanese Gardens in the country. This restorative space is used for meditation and quiet reflection.

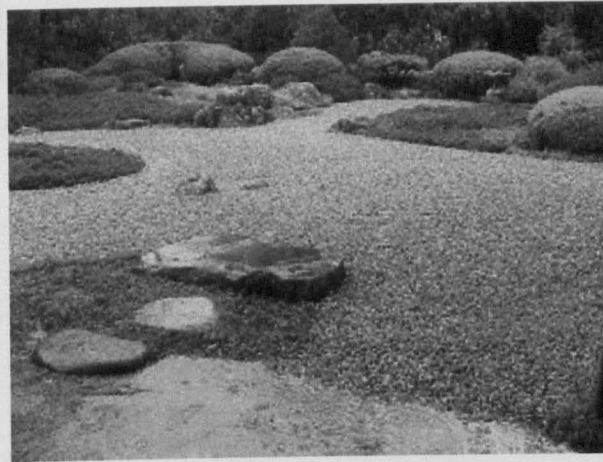


Figure 2.3 The Japanese Garden in Carleton College Nortfied
Source: Google Image, 2017.

2.3 Participatory Planning and Design

Participatory planning and design approaches were developed in 1960s with the growth of community against the top-down decision making mechanisms and this planning become more concerned due to the social and environmental problem impacted by the onset of industrialization in the 19th century . This participatory planning and design is purposely to involve the stakeholder for participating in decision-making process to shape the built element in order to protect the proposed sample area and environment (Tress and Tress, 2003). Generally, this participatory planning and design is carried out for making right decision in design process. Then, the main stages of the design process can consider the general decide model of identify, design, selection, implementation and evaluation of environment (Mohammad and Mahmoud, 2011).After through this consideration, the design process will become more successful and achieved the sustainability initiative in landscape

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