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## FOSTERING ECOSPHERE IN THE BUILT ENVIRONMENT

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	UMRAN2014 ORGANIZING COMMITTEE TABLE OF CONTENT PREFACE ACKNOWLEDGEMENT	i-ii iii-v vi-vii viii
TH Ses	EME: FOSTERING ECOSPHERE IN THE BUILT ENVIRONMEN sion A: Exceeding The Norm Of Sustainability In Built Environment	Т
1.	Human Dimension On Fish And Amphibian As Indicators For A Healthy Environment In Urban Lakes Of Kuala Lumpur Lukman Ramli, Liyana Bakeri and Zainul Mukrim Baharuddin	1
2.	Assessing The Implication Of Ecology On Scenic Beauty Preferences Of Fraser Hill Nur Emira Ahmad Kamaruddin, Nur Fatin Rashidah Abdul Ropal and Jamilah Othman	16
3.	The Impact Of Landscape Setting And Architectural Element On The Outdoor And Indoor Microclimate: A Case Study Of Masjid Al- Mukarramah, Bandar Sri Damansara Nur Yasmin Mohd Adnan, Nur Fadhilah Rozali, Aniza Abu Bakar, Nurhayati Abdul Malek, Rosniza Othman and Aliyah Nur Zafirah Sanusi	32
4.	The Impact Of The Outdoor Design And Architectural Dimension Of Masjid SHAS Towards Microclimate Aslina Abdul, Nur Ikma Mohamad Nasir, Aniza Abu Bakar, Nurhayati Abdul Malek, Rosniza Othman and Aliyah Nur Zafirah Sanusi	49
5.	Aspect Of Tree For Controlling Outdoor Microclimate: A Case Study In IIUM Mohamad Nur Ridhwan Mohd Nordin, Mohd Nasrul Nafizie Mad Nafiah, Aniza Abu Bakar and Amira Nadhirah Mohamad	58
6.	Study On Wild Birds And Elderly People In Relation To Sustainable Construction Noor Sharlisa Dawi, Nur Syahirah Masdar and Ismawi Hj. Zen	72
7.	Tourists' Perceptions Towards Nature Trail Facilities Management: A Case Study Of Bukit Nanas Forest, Kuala Lumpur Siti Nazirah Kamaruddin and Mohd Zin Mohamed	89
8.	The Effect Of Landscape Design On The Values Of Housing Areas In Klang Valley Fitrynadia Mohd Shahli, Mohd Ramzi Mohd Hussain, Izawati Tukiman and Nurbazliah Zaidin	106
Ses	sion B: Vitalized Built Environment As Catalyst For Heartier Commu	inity
9.	Examining The Social And Communal Values Of Urban Square Towards Families And Youth Muhammad Ruzaini Roslan, Noor Aqmal Hakim Noor Azman and Khalilah Zakariya	121

10.	Provision Of Spaces And Space Quality In Housing Area Towards Quality Of Life: Case Study Of Taman Melati Mastika, Gombak Muhammad Faiz Abdul Malek, Wan Mohamad Saifuddin Wan Hashim, Aniza Abu Bakar, Nurhayati Abdul Malek, Rosniza Othman, Aliyah Nur Zafirah Sanusi and Mohamad Abdul Mohit	135
11.	Emerging Relationship Of Spatial Design And The Activity Form Of Urban Park Nur Ezzati Adnan, Nor Hidayah Ramlan and Izawati Tukiman	151
12.	Evaluating Guidelines On Open Space And Its Impact Towards Users Satisfaction In PPR Housing Area Nur Athirah Kassim, Nurlaili Firdaus Che Othman and Mahadi Katang	166
13.	The Quality Of Housing Environment And Green Open Space Towards Quality Of Life Ainatul Izzah Ishan, Nurul 'Ain Mohd Norddin and Nurhayati Abdul Malek	183
14.	Physical Factors And Social Attributes For The Liveliness Of Urban Plaza At Bintang Walk, Kuala Lumpur Nabila Farhah Mohd Noor, Aimi Zarak Ali and Mazlina Mansor	199
15.	A Review On Contribution Of Landscape Settings In Hot-Humid Region Towards Modification Of Outdoor Microclimate Amira Nadhirah Mohamad, Aniza Abu Bakar and Aliyah Nur Zafirah Sanusi	215
16.	Urban Green Spaces In Determining The Housing Price: A Theoretical Framework Mohd Nasrul Hanis Manzahari, M.Zainora Asmawi and Noorzailawati Mohd Noor	233
Ses Cha	sion C: Green Technology Innovation As An Indicator For Emerging allenges	
17.	A Study On Homestay Concepts Of Tourism Program Development In Malaysia Muhammad Saufi Daud, Muhammad Saddam Husin Daud, Muhammad Faridzman Samani and Rashidi Othman	245
18.	Visitor Perceptions Of Water Fountains Towards Space (Indoor, Outdoor) Kamil Fahmi Ali, Siti Nor Ain Nasihah Mustfar and Jasasikin Ab.Sani	259
19.	A Study On Urban Morphology Using GIS, Remote Sensing Technique Marina Mohd Nor and Norzailawati Mohd Noor	273
20.	Perception Of Campus Community Towards The Application And Practicality Of Campus Farming In International Islamic University Malaysia, Gombak Norul Hafizah Yusoff, Nurfaezah Ghani and Putri Haryati Ibrahim	288
21.	A Study On The Importance Of Material Selection For Hardscape Surface Structure Mu'az Mohamed Zainal Abidin, Aiman Yusri and Mohd Ramzi Mohd Hussain	303

22.	The Potential Of Water Filtration System For IIUM Gombak Norsyafiqah Abd Kadir, Nurkhaleda Mohd Nasir and Izawati Tukiman	312
23.	A Study On The Potential Of Campus Outdoor Classroom In KICT, IIUM, Gombak Nur Syakirah Mohmad Sayuti, Nurul Hani Muhamad Noh and Maheran Yaman	326
24.	The Potential Of Outdoor Space Utilization For Learning Interaction Nazliah Hani Mohd Nasir, Farha Salim and Maheran Yaman	343
Ses	sion D: Culture And Art Towards Enhancing The Quality Of Life	
25.	Landscape Furniture Of Royal Palaces And Malay Traditional Houses Muhammad Ariff Faisal Azhar, Aizuddin Iklil Shah Ahmad Shafiee and Nor Zalina Harun	359
26.	A Study On Job Satisfaction And Turnover Intention Among Quantity Surveyors Nik Nur Azirah Mohamed Nor and Tan Chin Keng	375
27.	Cultural Landscapes In Built Environment: A New Perspective Nurbazliah Zaidin, Mohd Ramzi Bin Mohd Hussain, Izawati Tukiman and Fitrynadia Mohd Shahli	389
28.	Mangrove Forest: Degradation And Rehabilitation Mazni Adibah Abd Rahman and M.Zainora Asmawi	398
29.	Assessing The Values And Potentials Of Public Art In Campus Public Space Ainul Samihah Albohari, Annur Jalilah Ramlan and Khalilah Zakariya	411
30.	Islamic Landscape: The Interpretation And Viability Of Islamic Courtyard In Malaysia Aisyah Mahmood, Noor Fatin Syakilla Zubir and Jasasikin Ab.Sani	429
31.	A Study On The Effectiveness And Utilization Of Courtyard In Kulliyyah Compound Norsyahira Ariffin, Nik Nor Asiah Nik Nor Azman and Putri Haryati Ibrahim	443

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### URBAN GREEN SPACES IN DETERMINING THE HOUSING PRICE: A THEORETICAL FRAMEWORK

M.Zainora Asmawi<sup>1</sup>, Mohd Nasrul Hanis Manzahari<sup>2</sup> and Noorzailawati Mohd Noor<sup>3</sup>

#### ABSTRACT

Over the years, there is an obvious loss of green spaces in Kuala Lumpur in order to give ways for more developments. As a result, the reduction of green elements could affect the quality of life of urban dwellers. Urban green areas as environmental goods are essential to support the quality of life. As there are mixed evidences on the relationship between green spaces and house price, this paper attempts to set up a framework to consider the importance of green areas in the housing market. The literatures present particularly at the international level that the relationship exists either in positive or negative pattern. Thus, this paper mainly focuses on the theoretical framework of considering green spaces as a factor determining house price in Kuala Lumpur. Several steps have been carried out during the preliminary study which included literature review, questionnaire survey, site observation and GIS application. In order to study how green spaces could be considered as a factor determining house price, the definition of green spaces has been narrowed down to open spaces, a sub-type of green spaces due to fact that open spaces are easier to recognize and survey. The effect of green spaces in determining house price can be surveyed by analyzing the relationship between the proximity of open space from specific house with the offered price surveyed from the house owners through questionnaire survey. The utilization of GIS can assist in providing a reliable set of results which requiring the availability of information on existing land use, urban pattern identification and computation of landscape metrics. This paper has identified significant point which is - it is possible for green spaces to influence the house pricing in Kuala Lumpur. The theoretical framework and methods presented in this paper appear practical, workable and reasonable to obtain reliable results in future stages of the research.

Keywords: green spaces, housing price, environmental goods, framework.

#### **INTRODUCTION**

Of particular concern was an urgent need for green areas in the necessary areas within the urban fabric which provides significant services to the environmental quality of the areas, including providing higher quality of life (QoL), preserving wildlife habitat and enhancing environmental quality especially in big cities like Kuala Lumpur. The importance of urban green spaces has been long known as they provide various benefits to the population in term of healthy environment as well as providing higher quality of life (Bedimo-Rung et al., 2005). Furthermore, as indicated by Baycan-Levent and Nijkamp (n.d), the benefits of green spaces have been highlighted in a more rational and convincing way by incorporating the benefits into social, economic, ecological and community planning benefits. In fact, history shows urban land use planning and urban land market are ideally co-existed in current economic and decision-making process that eventually fluctuate the market price of housing stock especially in urbanised areas. Economic arguments can help to make a wise decision about the trade-off between preserving environmental quality are adequatelyquantified in a sensible manner.

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In the local context, in relation to the economic growth of the nation, it is greatly noticeable that nowadays there is an increasing trend in the Malaysian housing price. Many researches in the property field demonstrate that the house price movements are very much influenced by both fundamental macro and micro factors such as real income growth, interest rate, supply and demand of housing units, location, house design and others. However, there are not many studies undertaken to investigate the relationship between the provision of open space and house price in the Malaysian context. At the international level, many studies on open space and house price were conducted with a mixed of findings, ranging from positive (see Mahan et al, 2000) and negative pattern of relationship (see Weicher and Zerbst, 1973).

The nature of green areas which is scattered limits the researchers from tracing every single bit of green elements within sites. Thus, a sub-type of green areas, i.e. open space is used specifically for this research. Generally, the term 'open space' encompasses a wide range of land uses including urban parks, forests, gold courses, sport fields, undeveloped land and agricultural land at the urban fringe (Brander and Koetse, 2007). For the purpose of this research, the types of open space that involved are: neighbourhood park; playground; and playground lot. It is important to stress here that the word 'open space' refers to recreational park used by public located within neighbourhood areas.

Therefore, this paper attempts to study how green areas can influence the house price. Even if it could be considered as an influential factor, the study consequently will discover the strength of the relationship between green areas and house price. The scopes of study cover the aspects of the provision of open space, house price and GIS application. The scope begins with the provision of open space in terms of its location, proximity, size, hierarchy, facilities provided and maintenance within the residential areas. Referring to the guidelines of open space and recreation by FDTCP (2010), the research only focused on three selected type of open space (Refer Table 1).

Туре	Size	Population	Walking	Function
	(hectare)	size	distance	
			(meter)	
Neighbourhood	2.0	3,000-12,000	400 m	Recreation area in the neighbourhood area for
park				recreation activities, sports and social activities for
				local residents.
Playground	0.6	1,000-3,000	150 m	Recreation area to accommodate 3 sub-
				neighbourhood for active recreation activities,
				sports activities for the use of children and adults
Playground lot	0.2	300-1,000	50 m	Active recreation in a sub-neighbourhood area for
				children

Table 1: Types of open spaces involved in the research

#### **DEFINITION ON GREEN SPACES**

According to Mambretti (2011), the connotation "green" does not always represent green in colour neither from ecological nor biological point of view. Green area is an area permanently covered with vegetation (Csapó, 2012). While Nilsson (2010) includes variety of sites characterized by the presence of vegetated land and water in the definition of green space which

Source : Federal Department of Town and Country Planning, 2010

is similar with the definition of green areas suggested by KL Structure Plan 2020 which defines green areas as:

"Areas generally covered with natural or planted vegetation, consist of open areas, utility spaces, recreational and infrastructure corridors, buffer zones, forest reserves, agriculture areas cemeteries nurseries shrubs areas, cemeteries, nurseries, Open Space and residential compounds."

Source: http://www.dbkl.gov.my/pskl2020/english/glossary.htm

However, this definition can be vary based on different localities and perceptions of local authorities towards green space. Mambretti (2011) on the other hand, defines green space as "not built urban space" either in the form of survived nature or contemporary leisure parks. Based on these discussions, it can be simplified that the definition of "green areas" includes any element of vegetation on the ground.

#### **DEFINITION ON OPEN SPACES**

According to Maruani and Amit-Cohen (2007), the term 'open space' was first used in 1833 by a public committee in an exercise of "*public trail*" in London. This committee is also believed to be the agency responsible for creating the term 'open spaces' (*Ibid*). The phrase "open space" has been defined in a variety of ways due to different contexts and ways of discussion. Anderson (2001) adopted the approach of estimating amenity values of open space which include public parks, golf courses and cemeteries. While KL Structure Plan defines open space to be "consists of park, city park, district neighborhood park, local park and local play area". Some of these areas may have water bodies like lakes and flood retention ponds. There are many forms of open space which have been created from redevelopment (Steiner et al., 2012). It is stated in Town & Country Planning Act 1976 (Act 172) that:

"open space" means any land whether enclosed or not which is laid out or reserved for laying out wholly or partly as a public garden, park, sports and recreation ground, pleasure ground, walk or as a public place" (p. 12)

Based on this understanding, it can be understood that the definition of "open space" includes any open piece of land which is undeveloped (has no buildings or different engineered structures) and is accessible to the users. Over the years, it is noticeable that the usability and design of open spaces evolved in line with the developments and trends of the times. Today, the term 'open spaces' is adopted worldwide as areas for various activities such as recreation and as places for people to meet and socialize.

Open space basically provides recreational areas for residents and helps to boost the wonder and environmental quality of residential neighborhoods. Generally there are two types of open space which are public and private open space. Kuala Lumpur Structure Plan 2020 for instance, defines public open space as open spaces which are designated for public use while private open spaces as open spaces which are provided by private developers where the use is limited to specific groups such as golf course, polo field and driving range.

Green areas and open areas cater various visits every day from the family outing in a large country park to the daily visit to a local park for leisure activities. These demands can best be met by providing a hierarchy of parks, with parks in each tier designed to meet different

needs. A clear hierarchy of open spaces is provides a clear network of linkages to be enjoyed by pedestrians, cyclists and other users. The Federal Town and Country Planning Department has set the level of hierarchy of open space that should refer to the size of area and its population catchment size (Table 2).

Table 2. The therateny of open spaces in Malaysia			
Hierarchy	Size of area (hec)	Population size	
National park	Unlimited size	Nation population	
Regional park	100	Regional population	
Urban park	40	50,000	
Local park	8	12,000-50,000	
Neighbourhood park	2	3,000-12,000	
Playing field	0.6	1,000-3,000	
Playing lot	0.2	300-1,000	

**Table 2:** The Hierarchy of Open Spaces in Malaysia

Source: Federal Town and Country Planning Department, Peninsular Malaysia, 2009

#### **DEFINITION OF HOUSE PRICES**

Thiboedeau (1997) mentioned that housing is a composite commodity which consists of bundle of various categories and characteristics including land, location, structural, neighborhood and proximity to amenities. The changes in price of composite commodity are measured based on fixed bundle price. House prices are based on real estate valuation. In arriving to these value, the factors of the pricing can be quantifiable or not quantifiable (Yu et al., 2005). In assessing any single factor when arriving to the final house prices, dummy variables and proxies are needed to reveal the effects and subjectivity of the factors. Depending on the market situation, the appreciation rate for new properties might differ substantially from older properties.

#### **Offered price**

The offered price is the price which depends on the opinions, willingness and desire of the prospect buyers and vendors on the value of particular property. The offered price might be bias as it solely depends on personal opinions and cannot represent the actual value of the property. The offered price might be higher than Market Value (MV), on the par with Market Value or lower than Market Value. It is the owner's right to decide the price that he or she would like to offer for the property. The offered price normally can be viewed in advertisements posted in various media which include online advertisements such as advertisement portals, websites, social media and offline advertisements such as ads in newspapers and magazines.

#### **Actual price**

The actual price can be defined as the market value for a property which is based on the data recorded by valuer, valuation report, appraisers or past evidences. Commonly financial institutions in Malaysia depend on the actual price as the basis of loan approval and property valuation. However the actual price might slightly different between financial institutions due to differences in policies and opinions by appointed valuers or appraisers.

#### **Transacted price**

Transacted price refers to the final price of the property sale usually stated within the legal documents of the transaction such as Sale & Purchase Agreement, Valuation Reports and Letter Offer for Loan for financing purpose. Transacted price is recorded as the evidence to be referred for future house pricing. This research put utmost consideration on the transacted price as it is regarded as the "real price" of the property in most cases as most house sellers abide to this price which generally follows the values estimated by registered valuers and financial institutions compared to Offered Price which solely based on the willingness and desires of the house sellers. However several cases recorded that house sellers sold their properties below the market value estimated by the financial institutions thus has to be referred back to Actual Price.

#### **OPEN SPACE AS ENVIRONMENTAL GOODS IN RESIDENTIAL AREAS**

The development of environmental awareness has resulted in a strong demand by urban residents for green space/open space for various purposes, including aesthetic enjoyment, recreation, and access to clean air or a relatively quiet environment (Miller,1997; Tyrvainen and Miettinen, 2000). However, amenity values attached to urban open spaces are considered as non-market price to the environmental benefits (Grey and Deneke, 1978; Miller, 1997; Tyrvainen and Vaananen, 1998) that cannot be directly traded on an open market (More et al., 1988). Such conflicting trends raise the need for green space protection and allocation, which in turn requires estimates of the recreational value of green spaces. The determination of the value to society of such non-market priced recreation resources is not a new concept to environmentalist and economists. The trend in the housing market shows that contingent valuation method is the most prevalent method used to estimate an economic value for environmental goods. The global environmental movement has led to the recognition of open space as significant environmental goods is not strong enough, its provision within residential areas is given emphasis by the government.

#### **Requirement of open space in the town planning practice**

In the Malaysian local context, the definition of open spaces under Section 2 (1) Town and Country Planning Act 1976 (Act 172) is "any land that is enclosed or not enclosed, for use or reserved for the use in whole or in parts as public gardens, public parks, public sports and recreational fields, tourism areas, pathways or public places" (p. 15). In general, open spaces can be considered as an open area designated for the public to carry out their recreational activities.

Within the context of urban planning implementation policies, the issue of provision of green areas is normally associated with the requirement mentioned in any proposal plan or development plan. There are various requirements adopted by governments all over the world. In Malaysia, the importance of reserving allocated portion for open space is legally supported by the law as it has been mentioned repeatedly in Town and Country Planning Act 1976 (Act 172) on the importance of concerning the allocation of open space in proposing the development plan including Section 8 (3) (a) which provides that the local planning authority must consider measures for the improvement of the environment and the management of traffic (AinulJaria, 2012). Besides that the State Planning Authority should reserve the green areas as part of open spaces under section 62 and 204D while National Land Code 1965 provides that common planning practice in Malaysia requires a 10% of the total development areas to be preserved for

open space. Figure 1 shows some referencing points when dealing with the provision of open space in the context of Malaysia.



Figure 1: Examples of several documents which include the requirement of open spaces

In Malaysia, a Local Planning Authority (LPA) is the body that responsible in executing and enforcing the public open space policy within their respective administrative areas. The 10 percent provision for public open space applied in every housing scheme is a basic value set by the Federal Government through the JBPD 7/2000 guideline. In reality, the 10 percent value and requirements of public open space varies among Local Authority and the States in Peninsular Malaysia.

#### MACRO AND MICRO FACTORS IN HOUSING MARKET

There are numerous factors involved in determining house prices that basically relates with the economic and social considerations in one's country. In this context, the interests of many involved stakeholders have been taken into account that generally reflects the housing market scenario. Generally, the factors can be largely divided into two; macro factor and micro factor. However, this research could only be focused on selected several macro factors and micro factors as it is not the key scope of study, as follows:

- i. Gross Domestic Product (GDP)
- ii. Interest rate
- iii. Supply and demand
- iv. Economic factor
- v. Government and bank policy
- vi. House price movement
- vii. Population pattern
- viii. Labour force
- ix. Inflation rate
- x. Real Property Gains Tax
- xi. House design and size
- xii. Location and distance
- xiii. Public facility
- xiv. Accessibility

# DEVELOPING A FRAMEWORK: THE RELATION OF OPEN SPACE AND HOUSE PRICE

This section outlines and justifies the broad methodological approach for the study. This research employs descriptive and argumentative analysis to explain the relationship between the two aspects. Recognising that all methods have their limitations (Creswell, 2003), this study avoids bias by applying mixed methods by using: 1) literature reviews; 2) structured close-ended questions in questionnaires survey; 3) an analysis of a GIS technique; and 4) site observation. It combines qualitative and quantitative approaches from multiple disciplines and uses commonly employed techniques to address research topics in applied social science. No one method relates to any one particular section or chapter as the information from each method is used and referred to throughout the discussion. The techniques supplement and validate each other for analytical purposes. In addition, the establishment of data collection was generated mainly based on research objectives, research questions and general inquiries (Refer Table 3).

<b>Research</b> objective	<b>Research question</b>	Inquiries (Methodology)	
#1: To determine the elements of open space which influence the house price	What are the fundamental elements of open space desired by the house buyers?	<ol> <li>Definition of significant terms on open space and house price (Literature review)</li> <li>Understanding the concept of open space (Literature review)</li> <li>Understanding the concept of house price and its associated matter (Literature review)</li> <li>Indication of significant elements of open space in relation to house price (Literature review, questionnaire survey &amp; descriptive statistics via SDSS)</li> </ol>	
#2: To determine the major macro and micro factors involved in purchasing a house	What are the major macro and micro factors that house buyers consider when they purchased their house?	<ol> <li>SPSS)</li> <li>Definition of significant term in house market (Literature review)</li> <li>Indication of significant macro and micro factor involved in the house market (Literature review, questionnaire survey &amp; descriptive statistics via SPSS)</li> </ol>	
#3: To investigate the effects of the provision of open space on the housing price in selected neighbourhood areas in Greater Kuala Lumpur;	What is the effect of open space on house prices in the area of Greater Kuala Lumpur?	<ol> <li>Understanding the effects of open space on the house price (Literature review)</li> <li>Statistical analysis on how open space can influence the house price (Questionnaire survey, descriptive statistic via SPSS and GIS analysis)</li> </ol>	

**Table 3:** General inquiries in determining data collection methods

Figure 2 displays the sequence of main research methods involved in the overall research activities.



Figure 2: The overall research method

This study employed both primary and secondary data. For primary data, the main techniques adopted are questionnaire survey and observation on the ground (Refer Table 4).

<b>Research Methods</b>	Type of data	Purposes		
Literature review	Secondary data	To extract factual information based on recorded analysis pertaining to		
		the subjects of open space and house price locally and abroad as well		
		as referencing points.		
Questionnaire survey	Primary data	To identify the effects of open space over house price from the		
		perspective of house owners.		
GIS analysis	Primary and	To acquire the information based on the spatial and network analyses		
	secondary data	that reflect the pattern of the relationship between open space and		
		house price on the ground into the GIS format.		
Site observation	Primary data	To identify the current situation on the ground within the selected sites		
		pertaining to the provision of open space.		

**Table 4:** Research methods and its purposes

Subang Jaya has been selected to become the study area to test on the relationship between green areas and house price. The long establishment of this township is suitable to see how the green areas could give effect on the housing market generally. In term of its background, originally it is a township of Petaling Jaya, which has earned its own municipality (Majlis Perbandaran Subang Jaya) as a result from high population and rapid developments. The area was originally an oil palm plantation called Seafield Estate before the development started by Sime UEP Berhad in 1974 and completed in 1988.Subang Jaya is well known as a light industry hub within the Klang Valley where it hosts the Malaysia headquarters of PROTON (Centre of Excellence), Lotus Cars, Fabers-Castell and several other major international corporations.

In addition, Subang Jaya is one of higher education hubs with a number of international educational institutions such as Taylor's University Faculty, SEGi University School, University of Wollongong and Metropolitan School commonly within SS15. This results in more high-rise developments surrounding the area. Healthcare services in Subang Jaya are provided by private hospitals including Sime Darby Medical Centre Subang Jaya in SS12 along with Sunway Medical Centre in Bandar Sunway. In term of access, Subang Jaya is well-connected to the cities of Kuala Lumpur, Shah Alam, Petaling Jaya Ara Damansara, Kota Damansara, Damansara Utama and Mutiara Damansara through a network of major highways such as the Federal Highway, Shah Alam Expressway (KESAS), NKVE, NPE, North South Expressway and Lebuhraya Damansara-Puchong (LDP). Among all roads, Persiaran Kewajipan and Persiaran Tujuan are the busiest roads in Subang Jaya during rush hour to and from Kuala Lumpur.



Figure 3: Neighborhood parks within Subang Jaya (From left: Putera Heights, USJ20, Jalan 14/6)

SUBANG JAYA		
Location	:	3°3′52″N 101°35′37″E
Size	:	$70 \text{ km}^2$
Year established	:	1974
Population	:	708,296 (2010 Census)
Prominent developer	:	Sime Darby Berhad
Local Authority	:	Subang Jaya Municipal Council (MPSJ)

#### DIRECTION OF RESEARCH: TESTING THE RELATIONSHIP BETWEEN GREEN AREAS AND HOUSE PRICE IN SUBANG JAYA

Several observations were made regarding the subject matter, i.e. the relationship between green areas and house price in Subang Jaya, as follows:

- i. Generally, the preliminary study found that there are several major macro and micro factors that influence the housing market directly in which it is the attempt of the research to discover the influence of green areas towards house price. These perceptions can be grouped under two fundamental aspects. Firstly, the degree of the influence either in positive or negative pattern of relationship is examined. Secondly, the potential of green area as a micro factor in sustaining the house price is an important component to analyse.
- ii. Engaging in house owners in the survey is crucial as they would provide first-hand latest data on the pattern of relationship between green areas and house price. House market typically involves some degree of commitment from house owners. This statement directs to the importance of green areas in addressing the fundamental factor in marketing house in this contemporary era.
- iii. In relation to point (ii), the research will further identify the essential macro and micro factors for the house owners in purchasing property in certain areas. More importantly, this paper can explore the question of how they perceive the effect of green areas to house price. It is hoped that the research can offer a new dimension of looking at the green areas an environmental goods in planning, managing and marketing the property in the coming years in Malaysia.

#### CONCLUSION

This paper attempts to discover how green areas could affect the house price particularly in urban areas including Subang Jaya. Literatures and past researches demonstrate that the relationship between green spaces an property exists either in positive or negative pattern as in Malaysia, housing valuation emphasizes more on economic influences such as Gross Domestic Product (GDP), interest rate, bank policy and the structural factor of the house itself such as design and size. The current phenomenon in the housing market reflects that there is somehow the influential factor that is directed by the provision of green areas especially in the urbanized areas within the Klang Valley area. This phenomenon can be tested and analyzed through the analysis of secondary data, site observation, questionnaire surveys and utilization of Geographical Information System (GIS). Through the implementation of these research methods, the information pertaining to the existing housing lots and green spaces within the study area can

be extracted and analyzed. The analysis will eventually lead to findings which mainly discuss on the effects of the green spaces on the house prices in Subang Jaya. As the extracted secondary data and site observations provide background on the situation of house prices and the existing green spaces on the site, the implementation of questionnaire surveys and utilization of GIS provides insight on the relationship between these two subject matters. Thus it is possible to conclude whether the green spaces relate to housing prices in a positive or negative direction in the study area. It is the hope of this paper that it could pave the way of considering the importance of green areas in house price.

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### A STUDY ON THE EFFECTIVENESS AND UTILIZATION OF COURTYARD IN KULLIYYAH COMPOUND

#### Norsyahira Ariffin<sup>1</sup> and Nik Nor Asiah Nik Nor Azman<sup>1</sup> and Putri Haryati<sup>3</sup>

#### ABSTRACT

The open spaces are increasing popular in public spaces as well as institutional like schools, colleges, and universities. They can be creating in spaces that are small or large, private or public. Open space can serve many functions in institutional area. The study builds on and contributes to work on the effectiveness and utilization of the courtyard in a campus setting International Islamic University Malaysia (IIUM). It briefly discusses on the functions of courtyard and potential factors that attract the students to utilize the courtyard. The research examines the comparison between the courtyard of the Kulliyyah of Engineering and Kulliyyah of Economic and Management Science as the study area. The analytic focus on the effectiveness of courtyard in the Kulliyyah's compound enables another contribution. This study also recommends the design criteria and consideration to create successful courtyards at the Kulliyyah's compound. Questionnaire and observation techniques were used to collect data about students' awareness, their attitude toward, and their needs towards the courtyard. The preliminary result of the research shows that students with different purposes used courtyard in the Kulliyyah's. Courtyard in the Kulliyyah's compound plays important roles toward the users where the courtyard gives positive benefit for the Kulliyyah's community. The findings concluded that both of the courtyards should be redesign to improve the courtyard area towards a place for education environment and fulfil the users' needs. Thus, many users can benefit from it.

Keywords: courtyard, open space, Kulliyyah, institutional, campus

#### **INTRODUCTION**

Open spaces are vital for dwellers that live in an urban setting and institution environment. According to Wang, S. Y (2011), open space is important and are being utilized by the students, faculty and staff, and community members. The usage of an open space especially courtyards, give beneficial impacts to an educational setting. A Courtyard is space that located between buildings and surrounded by walls. The researcher mentioned that in the recent 20 years, campus open spaces are being redesigned or enlarged by many colleges and universities. While, Reynolds, J. S. (2002) in the other hand mentions that courtyards are places that are in contact with nature and is closely related to the surrounding rooms. It shows how important native environment is to people in their daily lives. As much as urbanization has taken over, people will still seek natural settings to have a place to relax and have a peace of mind.

In an academic setting, courtyards play an important role by providing an outdoor learning environment for students. It will give them a whole new experience in their

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study life, including giving them a convenient and interesting space to study, be it for group works or in just revising alone. Besides that, a well-designed courtyard may attract students in fully utilizing the spaces prepared for them. This would challenge their creativity in using the spaces provided. The case studies are Kuliyyah of Economic and Management Science, and Kulliyyah of Engineering.

There are some problems that have been identify based on earlier observation. First, as seen on both courtyards, spaces are left abandoned during rainy days and during scorching hot days. Second, regarding the design of the courtyard, there are also not enough facilities provided for students to use the courtyard as their learning environment. Thirdly, in terms of plant selection, the trees planted do not provide enough shade for students to sit and relax at the courtyard.

The aim of this research is to identify the factors which determine the effectiveness and utilization of courtyard in Kulliyyah's compound. There are three objectives in this study. Research problems and questions were analyzed in order to obtain the objectives. First is to identify the problems or issues from the existing courtyards and the second objective is to identify the functions of courtyard and potential factors that attracts the students to utilize the space. The last objective is to suggest on the potential of courtyard's design as well as to determine which design can be more responsive to student's wants and needs.

As for the first objective, various problems could be identified by conducting some observations and survey. For the second objective the function of the courtyard is based on the environment, surrounding and its users. Hence, these functions may become a factor which attracts users to utilize the spaces. Lastly, a study on student's wants and needs were the main key in obtaining the potential of courtyard's design.

#### **Defining Open Space**

According to United States Environmental Protection Agency (EPA) (2013), Open space is an untouched land and people can direct access to it. As seen in figure 1, these are the spaces usually located in an urban setting and were provided for the utilization of users. Some of the spaces are left for the greenery and some other spaces are made into facilities in order to give benefits to the public.



Figure 1 : types of open space

Besides that, open space often comes under pressure for development in existing neighbourhoods or is at risk of being undervalued and underprovided in the planning of new subdivisions. However, in some cases a strategic assessment will identify a need to reorientate or rationalize existing open space to overcome past planning mistakes and to address access and maintenance issues. Md Dali M.et al. (2011) has drawn attention to the fact that open space is a piece of private or public land that designed for active and passive activities. Active activities can be in the form of sports, exercise, or active play while the examples of the passive activities are sitting and relaxing. The writers also classified that the open space as the land that help to protect and enhance the natural environment. On the other hand, open space is important as it promotes people to nature as well as gives benefit for healthy physical.However, Gold, S. M. (1980) defines open space as land and water in a city that is not covered by cars or buildings, or as any untouched land in an urban area. There might be an argument on where could the open space located whether in an urban area or in the sub-urban setting.

Overall, open space achieved the same agreement which Carr et al.'s definition emphasizes the accessibility of the space, defining public space as "open, publicly accessible places". There seems to be some evidence to indicate that open space is a place open to the sky where it is left for greenery in an urban setting.

#### Courtyards

According to <u>www.dictionary.reference.com-online</u>, "*Courtyard is an open area of ground surrounded by walls or buildings; court*" (dictionary.reference.com-online).

A classic courtyard is also an open-air space and it usually provide little to no cover from any elements. It is an outdoor area surrounded by buildings and homes, which then is further enhanced with landscape furniture such as benches, paved areas, plants and other elements to create an aesthetically pleasurable and functional design. Housing complexes, condominiums and apartment buildings are the examples which utilize courtyards to create a mutual, common, outdoor space.

Besides that, courtyards give good ventilation by creating a cool, breezy environment. Cool air from the indoor spaces is pulled into the open area while warm air rises to the top of the space. (homeguides.sfgate.com-online). Santamouris M, (2006) also stated that courtyards and light wells were widely used as to provide both ventilation and natural light to the urban buildings during the advent of air conditioning and deep-plan building.

Any outdoor space surrounded by walls are called as courtyards, but according to Keister, D. (2005), courtyards can be defined as an enclosed area partially and fully enclosed by a wall or building. While Almusaed, A. (2011) stated that courtyards are a pocket of space that open to the sky. Thus, based on this findings, the author concludes that a courtyard is a space open to the sky and partially or fully enclosed by building.

#### Historic Use of Courtyard

According to Lehrman, J. (1980), historically, the courtyard was used for many functions such as cooking, sleeping, working, playing, gardening and even places to keep animals. The earliest known courtyard houses were built in India and China and dated as far back as 3000 BC.

Before courtyards, home ceilings had a small hole to let smoke escape whenever they kept open fires burning in the house. As time goes by, these holes got bigger and bigger and transformed into courtyards as we know today. The evolution of courtyard design led to many different types of courtyard being present today depending on the context and civilization.

Different cultures living in different climates have different types of courtyard design. There are usually more courtyards in houses situated in warm weather climate context as the courtyard can help in cooling the house. In short, courtyard houses are already in existence in the rough climates as well for decades. The privileges include air, light, privacy, security, and serenity which are what humans need actually in a house.

The early stage of courtyard development has started in dwelling back then; however, nowadays courtyard is more popular in commercial and institutional buildings such as hotels, restaurants, offices, and colleges. It serves so many possible functions and endless variations of sizes and shapes.

#### **Function of courtyard**

An overview of the functions of courtyard will be required to ensure a proper design elements and the selection of elements within it in enhancing the sound as well as users' activities. Courtyard for a long time had been acknowledged as an area that bring nature within a building, and also moderate nature's extreme. According to Reynolds, J. S., (2002), courtyards are rarely as hot as the summer's mid afternoon, or as cold just before dawn, as the temperatures in the countryside, or even in the street outside.

Courtyard spaces delight the senses, which make obvious why architecture is such a life affirming art. As reported by Reynolds, J. S., (2002), "At their best, courtyards are exquisite landscapes, worthy centers of attention and activity within a building. In Hispanic cultures, they offer carefully framed views designed to attract the passerby. They offer a pleasant contrast to the environment of the street. At their worst, courtyards are small hole in buildings, concerned solely with the technical role of bringing light and air-however paltry and unpleasant-down to the space below". This is obvious that although courtyard may be a very pleasing space, yet people still did not fully utilize the courtyards. Thus, in term of design it is important to make wise courtyard as a well utilise space for its pleasurable environment.

Reynolds, J. S., (2002) indicated that courtyard landscape design helps establish a relationship with nature and human architecture. In a residential and commercial surrounding, the courtyard play important role to attract the users. For examples, courtyard in a restaurants create special outdoor seating areas to attract large crowds while in an office area, courtyard were used as an outdoor break areas and green space to lend a more environmentally image to business. In term of residential, courtyard space are used as a special area for meaningful conversation. Although the design of courtyard is different in its size and function, in general the courtyards space is certainly unique and special in its own way.

#### Guideline for planning and designing courtyard

Reynolds, J. S., (2002), has pointed out 44 guidelines for designing courtyard and arcades, but only several factors will be highlighted.

#### **Courtyard's Elements**

Several studies have revealed that for courtyard's hardscape, stair can be used as a stage. Stairs within courtyards take up space, but in return provide a wealth of views from multiple levels and chances to smell and touch vines that would otherwise be overhead, out of reach. Besides that, fountain, well, pond, tree, statue, large potted plant, table with chairs, hammock-something are the elements most of the courtyards would feature at the center or near their center to draw the eye and may invite people to stay. It also helps the courtyard to fulfil its role as the social centre of a building.

#### **Courtyard's softscape**

Previous studies by Reynolds, J. S., have reported that element for softscape such as vines and trees can celebrate seasonal changes. The sky is important for the courtyard's role; trees and vines both frame and filter the sky. Color, scent and swaying leaves add to summer delight, while in temperate climates, deciduous vines and trees provide a dramatic seasonal change, often including a change in the color, as well as the quantity of daylight through their leaves and branches. On top of that, plant in pots encourages flexibility in a courtyard as they are soft, organic foil to the hard, geometric courtyard. They can serve in many ways: attract attention, provide food or bouquets, and perfume the courtyard. They can be moved as needed to direct traffic, provide a privacy screen, and shade a resting place. Very few courtyards contain no potted plants; it almost seems that a lack of potted plants indicates a lack of concern.

#### **Courtyard's senses**

Furthermore, the researcher stated that plant texture can be defined as the visual roughness and smoothness of any parts of the plants. Textures depend on viewing distance. It is focusing on the textural effects of plants when viewed from medium distances of between 2 to 20metres because within this range, the detail of composition of the most ornamental planting is most fully appreciated. There are five principles dealing with visual texture which are harmony, contrast, balance, emphasize and sequence A sensory is full of different textures which ranged from coarse to fine or rough to smooth textures of surfaces. For various tactile experiences, the uses of timber, steel, glass, stones or concrete materials in landscape furniture are needed in the construction of the courtyards. Coarse textures such as cobbles, bricks and rubble stone draw attention to their surfaces. For this reason, textures can be used to downplay or highlight certain topography.

Mitchell, K., (2000) identifies in his study that combination of colors by using either plantings or hardscape materials can dramatically alter the mood of a sensory garden like tranquil, relaxing, energizing and stimulating. Warm colors such as red, orange, and yellow; enliven the emotions and promote activities. While cool colors, such as blue, purple, and white; tend to be soothing and promote tranquillity. A quality color can give a sense of relaxation and calmness to people, for instant students. Colors also alter perspectives. Light and cool colors enlarge space; dark and warm colors make the area appear smaller. Blue and Gray seem farther away than dark green and red.

Besides that, consider masking sound. Courtyard building has a very hard time

concealing secrets between its rooms, therefore "masking sound "Sometimes called acoustic perfume. Masking sound sources include trickling water, birdsong, wind through the leaves, and wind chimes. It's intended to cover up a conversation or other unwanted sounds that echo in the hard surfaces of the courtyard. Give water a place is a smart move as water representing cool, fresh and pure. Water is often at the center of the courtyard, where exposure to the sky and its rain is at maximum. Even if valued only for its evaporative cooling potential, water is a courtyard treasure.

The use of fragrant plants can make the difference between a pretty garden and an unforgettable one. Scents have an emotional impact that visual impressions often lack. Thus scents have been regarded as an essential component of the sensory garden, whether embodied in flowers, leaves, barks, fruits or roots. Fragrant plants may be divided into three categories, those emitting scents freely to nearly surrounding; those emitting scents when carefully smelled by a nose, and plant whose leaves must be crushed or bruised in order to release the scents.

Basically scents may be divided into several types. The most common types would be floral, citrus and spice. Floral scent has usually been associated with flowers. Flowers may produce an essence that produces pleasant smell. While citrus scent is derived from the fruit essence including lime, lemon, and etc. Spicy scents are commonly associated with herb and spices. The scent of herbs is normally distinct and hard to describe.

#### Edible garden

The garden may produce food, but the use of edible plants in landscape design is rare. However, in courtyard, various plants are planted for the purpose to be tasted. For instant, fruits, vegetables, and some herbs are perfect for stimulating sense of taste. It is an excellent way to evoke reminiscences and cultural exchange over food plants among the users. The most suitable fruit trees can be planted at female residential colleges are nonseasonal and the fruit can be eaten raw or fresh.

Lastly, rehearse a variety of roles for the courtyard. It is not restricted only one function as many possible functions and activity benefits from an occasional move outdoors, particularly when surrounded by the beauty and privacy of a courtyard. Reynolds, J. S., (2002)

All the above guidelines may help to improve courtyard environment by adding an appropriate element in the right place. It also has proven that sound from water and birds can really be applied in order to mask unintended sound made by the surroundings. Therefore, courtyard may create a sound that is beneficial to the users and it had been interested in this study in making the courtyard space in IIUM become admirable for its sound

#### METHODOLOGY

The methods were used to determine the success of the research aim and objectives. There were several methods that being used in order to collect data and analyze the topic. The techniques used in this research include observation, case studies, survey questionnaire and literature reviews. Observation used to deal with qualitative approaches, while the survey technique is used to cover on quantitative approach. For the observation methods, site conditions and problems in the courtyards were identified. Questionnaire methods were to identify the student's perception and their preference for the courtyards. Besides that, the methods also identify the functions of courtyards and their needs. The survey forms were prepared and distributed to the users, while the observation was conducted by the researcher. The processes of analyzing the gathered data were done after all the methods were conducted. The processed data was then graphically presented by using tables or bar charts using computer software such as Microsoft Excel and SSPS software. Result and findings for the next stage would use these collected data in obtaining a solid outcome later on.

#### **Data Collections**

#### A. Questionnaire

The instrument of quantitative method used in this study is survey questionnaire. The purpose of the questionnaire is to obtain results based on the student's feedback about the utilization of the courtyards in Kulliyyah of Engineering and Kulliyyah of Economics and Management Science. The questionnaire is divided into 3 categories which are respondent personal information, respondent site information and general planning of courtyard and were given to 25 respondents for each kulliyyah. Students are the main target in doing this survey as they are the main community who live in the campus. The students are required to give the feedback as they are the client of the university and this would allow them to reform the utilization and the sustainability issues in the courtyards. In the questionnaire, they are being evaluated on the awareness of courtyards among students and their perspectives on the utilization of spaces in courtyards. Besides, the survey also identified the current activities and spaces which required improvements. The survey was conducted during class hour and was divided randomly to each kulliyyah. Pictures were provided to the respondents in order to enhance deeper understanding of the elements in courtyards.

#### **Case Studies**

The case studies chosen are Kuliyyah of Engineering and Kuliyyah of Economic and Management Science, International Islamic University Malaysia (IIUM).(refer figure Further studies on these sites were conducted and site visit were done to find out the existing condition of the site.

Both Kulliyyahs were chosen because of the larger capacity of students compared to other. The Kulliyyahs are also among the biggest in the IIUM and have the most open spaces within its compound. From figure 3 below is the image of courtyard in Kuliyyah of Engineering while figure 4 show the image of Kuliyyah of Economic and Management Science.



Figure 4: Courtyard of Kulliyyah of Economic and Management Science

#### FINDINGS AND DISCUSSION

The survey questionnaire and site observation have taken place in two courtyards, which are at the Kulliyyah of Engineering and Kulliyyah of Economics and Management Science. 25 questionnaires were distributed to each Kulliyyah's as students of each respective Kulliyyahs are the main target of the research. Results from the methods used were to achieve the aim and objectives of the studies. All the data collected then

compiled and gathered for an ease of analysing as well as to identify the hierarchy of the information.



#### The problems or issues arise from the existing courtyards.

Figure 6 above show the courtyard of Kuliyyah of Engineering can be assess through two main entrance and six of others entrance. The courtyard is mostly surrounded by academic building such as classes and lab. From figure 5 we can see the image of one of thecourtyards's entance. While figure 7 above is image of a gazebo in the middle of courtyard and no activities can be done at the area .The gazebo act as only an aesthetics value, thus it use most of the open space in the courtyards of Engineering. Students only pass through it and never actually utilize the space. Besides the area is hot as shown in figure 7 a student was spotted using an umbrella just to walk through the courtyards. This observation proved that the place was quite hot during the afternoon, and they used umbrella for covering



Figure 11: entrance of the courtyards

Figure 12: empty space of the courtyard

Figure 13: material for the pavement

Figure 9 show the detail plan of courtyard in Economic. Problems of the courtyard is identify and divide in three aspects.

#### A)AMENITIES

The material used for pavement are not suitable as it cause the place to become very hot during day time. The courtyard area is fully covered.(refer figure 12 and figure 13) Besides, the bench provided also can not be utilized for many purposes as students can not lean to anything. (refer figure 12)

#### A) USABILITY

Figure 10 above shows the bird's eye view on one of the courtyard in the Kulliyyah of Economics. Most of the students did not utilize the courtyard as there were lack of facilities provided in the spaces. There are no shaded area at most of the spaces in the

courtyard which might be the reasons why students did not utilize the courtyard. Thus, students only pass through the courtyard but di not utilize the spaces due to the area is too hot.

#### C) ACCESSIBILITY

The main entrance that link parking to the courtyard is not well welcoming and the entrance is to small and not visible. (Refer figure 11). Figure 8 show that users did not use the existing pedestrian walkways but instead use a short cut below shaded trees



#### Problems in each Kulliyyah

Figure 14: Problems and issues arise from the existing courtyard

Based on the questionnaire data from figure 14 above, most of the respondents agreed that both Kuliyyah provide courtyard for them to utilize the space. It is found that 16 numbers of students from Kuliyyah of Engineering agreed that the courtyard have nothing interesting (refer figure 7). These issues also get highest numbers of student agreed from Kuliyyah of Economic and Management science. This finding demonstrates that the existing of courtyard does not fulfill their needs and the courtyards are not functioning properly. Overall, the results of this study show that both courtyards do not satisfy the users.

#### Activities in both courtyards

Based on the above chart, the majority students from Kuliyyah of Engineering utilize the courtyards for waiting for friend, resting and relaxing; whilst students from Kuliyyah of Economic and management Science utilize the courtyard for walking for class transition, waiting for friend and sitting. These activities are common because both courtyards are surrounded with classes. However, only 3 persons from Kuliyyah of Economic and Management Science use the courtyard for reading and non-student from Kuliyyah of Engineering use the courtyard for reading (refer figure 15). From the above interpretation, it shows that the students utilize the courtyards by using their own creativity although some of the spaces do not provide the suitable functions for those



activities. Therefore, both courtyards may need more interesting spaces for multipurpose functions in order to attract students to come to the courtyards more often.

Figure 15 : The activities in the courtyards at the Kuliyyahs' compounds

# Suitability of Hardscape, Softscape and Water elements in both courtyards



Figure 16: Student's agreement on the hardscape suitable for the courtyards

Figure 16 shows the number of students in each kulliyyah agreed on the elements of hardscape suitable for the courtyards. For Kulliyyah of Engineering, 19 respondents out of 25 agreed that bench is the most wanted and suitable for their courtyards while for Kulliyyah of Economics, the highest vote by students, which were 24 out of 25 respondents agreed that pedestrian walkways were needed in their courtyards. Although both elements were provided in the courtyards, the elements might need some improvement based on its materials and suitability it each respective courtyards. Both benches and pathway may need some coverings as during day time, the courtyards can be very hot which lead to the unutilized spaces by students.



Figure 17: Student's agreement on the softscape suitable for the courtyards

Figure 17 shows type of softscape which students agreed on its suitability for the courtyards. For Kulliyyah of Engineering, shady tree is the most needed by students for their courtyards as courtyards of Engineering have a lack of shady area. On the other hand, for kulliyyah of Economics, colorful tree is the most preferred softscape as the whole landscape in the compound seems to have lack of colors and very dull. For both kulliyyah, shrubs are the least preferred compared to the other softscape.



Figure 18: Student's agreement on the water elements suitable for courtyards

Figure 18 shows types of water elements which students think it is are suitable for their Kulliyyahs. For both Kulliyyahs, fish-pond is the most preferred as seen in the chart above. For kulliyyah of Engineering, 16 out of 25 respondents agreed on having fish-pond in the courtyards, whilst for Kulliyyah of Economics, 18 out of 25 interested for a fish-pond. This might be because students want to have some living things in their courtyards or something interesting to see during their free hours. The thought of having a fish-pond, might thrill and excite the students to come to the courtyards more often.

#### CONCLUSION AND RECOMMENDATION

#### Conclusion

Courtyards play an important role in an educational setting as it can provide various types of activities to the students if the functions of spaces are clearly defined to determine its optimum use. Courtyards could also give benefits helping students to refresh their minds after hours of concentration in classes. Besides that, a courtyard could improve the educational environment as it provides green outdoor environment in between concrete building spaces. However, a good design of courtyard is important in determining the usability of the spaces by students. Otherwise, the spaces will be left abandoned. This can be seen in some of the courtyards from both Kulliyyah.

The main reason of the study is to find out what are the problems of the courtyards, which lead to the unutilized spaces by students of Kulliyyah of Engineering as well as students of Kulliyyah of Economics. As the problems were identified, a solution and recommendation were provided so as to improve the current conditions of the spaces in the courtyards.

Students are the main respondent in the study as their needs lead to a good design of courtyard which by mean the spaces will get fully utilization from the students. On the other hand, based on the survey conducted, the researcher also found that shaded area is a vital element, which should be provided in the courtyards. An observation at the kulliyyah of Engineering shows that some of the students who pass through the courtyards were using umbrellas. This theory can be supported by an observation conducted at the Kulliyyah of Economics. Students of Kulliyyah of Economics did not use the provided walkways because the walkways are not shaded, thus they created a short cut under a shaded trees and use the road to go to classes and other buildings. To sum it up, the researcher has found that there are few important things that need to be catered for any courtyard design in an educational setting. Since it is a space within buildings, activities in the spaces plays a major role in attracting the students to fully utilize the courtyards and make the courtyards functionally active. However, during rainy seasons, there might be some limitation on the utilization of the courtyards. These problems could be overcome if the courtyards are not fully open to the sky. All in all, the maximum utilization of the courtyards may indicate the success of a courtyard design in an educational setting.

#### Recommendations

In order to achieve the goal, research study had been conducted through a variety of methods namely literature reviews, case studies, data analysis and findings. From the study, some recommendation for a successful design of the courtyard is gained to develop the study area. The ideas are based on the characteristics that are suitable for the courtyards namely softscape and hardscape elements, space and facilities as described in the followings:

#### Softscape

#### 1. Plant trees that can provide shade

Plants and trees are very important in landscape design. Plants basically have two purposes which are functional and aesthetic. In hot and humid climate, the student people tend to seek shelter from the sun. As the study area receive direct sunlight, trees that can provide natural shade to its surrounding is are recommended. Besides that, other fauna such as birds, squirrel and other animals can also utilize the plants and create an environment friendly design. The plants such as Casia fistula is also provide beautiful flowers. (refer figure 19)

#### 2. Plant colourful flower trees

Planting selection on the site are lacking of colour variation. From the observation there are lacking of colourful shrub and plants. Most of the plants are similar to each other, yellowish and greenish in colour. The colour plant can create liveable and stimulating outdoor environment such as sensory garden. Warm colours such as red, orange and yellow can enliven the emotion and promote activities. However, cool colour such as blue, purple, green and white help to soothing and promote tranquil to the area. Thus, combination of both of colour implement in the courtyard can stimulate certain types of emotion. The plant is bougainvillea. (refer figure 19)



Figure 19: redesign of Kuliyyah of Economic and Management Science

#### Hardscape

#### 1. Proposed fish pond with water cascade down

This element might be the key of inviting students to utilize the courtyards as this element gives something for the students to come back to the courtyards and enjoying the scene. The pond also gives some senses to the courtyards which are the sense of sound coming from the water cascade. Students would come to the courtyards just to see some fishes and enjoying the serenity of the whole environment in the courtyards. Besides, this elements also brings students closer to nature and give them the sense of calmness.

#### 2. Improving walkway's materials and path

The students of Kulliyyah of Economics did not use the existing pedestrian walkways but instead use a short cut below shaded trees. The path might be too hot during the afternoon, thus students tend to cover themselves from the heat of sunlight. The materials of the walkways need to be change as well as the direction of the walkways.

#### Space

1. Consist of variety of space to fulfilled users need and function.

The courtyards are design to fulfil the user need as well as its function. The users can do many activities within the space which has its own specific function. The propose spaces are:

- Gathering area proposed for gathering and meeting friends. Besides, the area can conduct ceremony.
- Seating area for relaxing and sitting. Besides the area can become as nodes or stop point for users before they proceed to the next place. Furthermore the area can become as focal point.

The design recommendation was derive from the problem occour within the site selection. The design ideas for the courtyards might fulfil the student's needs and wants as well achieving the ideal function of the spaces.

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