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## Students Expectation on Studying the Plants Identification in Outdoor Learning Environment

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### Abstract

In recent years, there have been growing bodies of research in an outdoor education setting. In the context of landscape architecture studies, the need to encourage the students to explore the nature is undeniably important. By exploring the landscapes, a better perspective and understanding of subject matter can be achieved. While there is a new approach of learning called as online learning, however, the actual experiential learning is still valuable and authentic to be studied. Through the literature findings and data analysis, the student learning expectations in this study are influenced by the physical outdoor setting and learning activities.

**Keywords:** outdoor learning; plant identification, student expectation, learning activities

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### 1.0 Introduction

"Learning is the process whereby knowledge is created through the transformation of experience" Kolb (1984). In 21st century education, learning through actual experience and ability to collaborate with surroundings is very important. The importance of learning experience is also highlighted in Malaysian Education System and become one of the tools to measure students' learning outcomes in the related field. According to The Ministry of Higher Education (2017), by encouraging the students to participate in an outdoor environment, a healthy personality and positive attitudes can be successfully developed. Previous research done by Noralizawati and Noriah (2017) and Marina et al., (2017) identified that students who are being exposed to outdoor learning environment could have better opportunities to assimilate new information and ensure lifelong learning. Outdoor learning settings are many and varied. They include, for example at the university campus, museum, park, garden, heritage and archaeological sites and forest reserve.

In recent years, there have been growing bodies of research in an outdoor education setting. The public awareness of nature and its potential to stimulate direct senses have determined these successful approaches. According to Packer (2004) enabling the students to rediscover their environment can contribute to their interest and motivation to learn. The situational factors such as interactive environment and professional facilitator (Noralizawati and Noriah, 2017), surrounded by nature elements (Marina et al., 2017), quality outdoor space (Norizan et al., 2017), strong spatial characters (Shamsidar et al., 2015) and comprehensive learning programmed (Huang, 2017) are found to be associated with greater learning experience too. From the previous examples, it shows that this study has expanded over the years and positively mapping the users' level of expectation.

In the context of landscape architecture studies, the need to encourage the students to explore the nature is undeniably important. By exploring the landscapes, a better perspective and understanding of subject matter can be achieved. While there is a new approach of learning called as online learning, however, the actual experiential learning is still valuable and authentic to be studied because it is

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connecting the students with what they are taught in the classroom to real world issues and applications. In this study, The Learning Model provided by Kolb (1984, 1976) will be used as a reference for authors to measure the students' expectations and outcomes. The model has been adopted by many researchers to improve student learning such as James E.S., (1987), Kolb and Kolb (2005) and Peterson et al., (2015) and they concluded that the effective learning could be achieved once the learners has passed all the learning stages and practiced their experience.

This study hopes to provide guidelines for an academicians to facilitate an outdoor classroom and knowledge delivery for the students. This study aimed to identify the potential of Perdana Botanical Garden as an outdoor learning environment for various plant species. The objectives formulated for this study are (1) to identify the potential of Perdana Botanical Garden as outdoor learning environment for students, (2) to discover students expectation when conduct their learning activity at Perdana Botanical Garden and (3) to identify factors that encourage students to learn at Perdana Botanical Garden.

## **2.0 Literature Review**

### **2.1 The Relevant of Outdoor Learning in Education World**

Outdoor learning is traditionally believed to give a better opportunity for the students to speak their mind and relate to tangible environment setting as compared to indoor classroom solely. It should be perceived as the total context of learning experience either in diverse or specific physical setting as well as encounters with people, places and ideas. According to Shamsidar et al., (2015), learning can be defined as social activities that intimately associate with the connection of human being (community service). Her research was consistently aligned and supported the earliest research done by Kolb (1984). Kolb identified that the combination of academic study and service in a community has to offer profound respond in education world. This approach is still accepted until this decade and explored by many researchers. The combination of these theories have not just provided knowledge to the students; it also leads to another method of teaching and learning styles. Packer (2004) who studied on motivation in education emphasized the users' social context, environmental restoration, education as positive entertainment and personal development in developing the theoretical framework of the study.

### **2.2 The Benefits of Outdoor Learning**

Recent studies in Malaysia have successfully proved the links between outdoor environment and human well being. As, Mohamed Yusoff et al., (2016) studied on environment behaviours in related to architecture and built environment. The research identified that a quality education could be achieved through excellence learning environment and knowledge must be shaped by using social interaction and senses communication. Another research done by Abdul Rashid et al., (2013) discovered the importance of experiential learning among community such as to ensure lifelong learning and achieve sustainability in life. Research has shown that interactive experience and continuous involvement will increase participant expectation in learning by Foo (2016) and Harun (2010). Besides the benefit of outdoor learning, Norizan et al., (2017) identified several criteria of quality of outdoor learning as reference. According to the study, beneficial for activities, reduce stress environment, view towards nature and manicured garden have contributed to the successful of outdoor spaces. Noralizawati and Noriah (2017) also underlined in their research that the outdoor landscapes should be well supported as learning space for students.

### **2.3 Botanical Garden as Students Learning Platform**

Research on the botanical garden as a platform to learn has started from awareness towards environmental education among educators (Botanic Garden Conservations International, 2018). Throughout the history, the botanical garden has evolved its function not just for plant collection, however as a platform for expertise on discussing the issues of urban awareness, food security, urban farming and community engagement (9th International Congress on Botanical Garden Education, 2014).

Series of research has approved that the botanical garden as an educational place and leisure activities for the public since many years ago. The garden is also known as a place to restore the greenness in the city as well as to spread knowledge in plants conservation. A lot of research identified that the science education such as arboretums and plants identification could be upgraded to another higher level, where the garden is treated as students' centre of learning and outdoor laboratory (Hensen, 2012; Mehdi and Koorosh, 2015; Packer, 2004 & Utama, 2015). Noriah et al., (2015) highlighted that the adaptations on human-oriented design in the gardens as an indicator of the best practised for outdoor learning. Marina et al., (2017) highlighted in her research that by incorporated nature elements it would promote stress-free while learning. Despite the benefits of the botanical garden as a platform to learn, the herbarium collection, suitability of plants and its composition also should be aware and by the management to ensure the gardens can be the best place for experience transformation.

## **3.0 Background of Study Area**

The Perdana Botanical Garden is situated within the Tun Abdul Razak Heritage Park, Kuala Lumpur which covers an area of more than 170 acres located in the heart of Kuala Lumpur. The garden is classified into two main functions which as botanic garden that serve a place for plant collection and scientific research and as recreational centre for local people. The garden has not only the botanical collections but also house feature that give the visitors the ambience of being in a tropical forest. This garden is open to the public on Mondays to Sundays from 7.00 am to 8.00 pm. There are many attractions around the garden, thus making it as one of the most visited

places in Kuala Lumpur. Forest Tree Collection, Plumeria Tree Collection, Waterfall and Fish Pond Area, Fernarium Collection, Zingiberales Collection, Heliconia Garden, Conservator Area and Herbarium Museum are among the places that are suitable for research and educational programmed for the students.

#### 4.0 Research Methodology

A survey method was used to collect data to address the research objectives to the fullest extent possible. Landscape architecture students from semester one and semester two recently participated in the survey of learning experience at Perdana Botanical Garden. Sixty students from Landscape Architecture programme were involved in the survey. The questionnaire was divided into five sections; demographical background, students' opinions on the garden as outdoor learning, students' expectation and also open-ended question regarding their overall opinion and suggestion for improvement. They were also asked to rate their understanding at every learning station based on explanation given by the garden moderator. They were also asked to rate the photographs showing different types of learning facilities at the final section using a five-point Likert scale where 1= not important, 2= less important, 3= moderate, 4= important and, 5= very important. Each selected photograph under these sections had both elements of landscape design and learning facilities. This study was administered by using a structured, designed questionnaire to collect data from the respondents. At the beginning stage, careful attention was given before designing the instrument where some observations were done to determine the places that contribute to different type of learning experience. This study is limited to Botanical Park in Kuala Lumpur and the respondents are students from Landscape Architecture Department who studied plant materials as core course at Semester 1 and Semester 2.

#### 5.0 Results and Discussion

##### 5.1 Expectation of the Respondents

The respondents participated in this study were students from Semester 1 and 2 from the Centre of Studies for Landscape Architecture. There were 60 respondents with 21 male and 39 females. Their ages range from 19-22 years old. The results identified that gender is the most influential factor in determining the student's expectation in outdoor learning at Perdana Botanical Garden.

Table 1 shows the respondents rating on variables related to their expectation when they visited the park. The alpha coefficient for the 15 items is 0.94, suggesting that the items have relatively high internal consistency.

Table 1: Mean Comparison between Genders on their Expectation from Visitation to the Botanical Park

Item	Variables	Male	Female	F	Sig.
1	To feel confident about myself	3.48	3.87	4.54	0.52
2	To get some ideas and use my imagination for design	3.50	3.89	4.42	0.11
3	To feel satisfied by touching the flowers and leaves	3.33	3.82	0.24	0.07
4	Outdoor learning with friends	3.75	4.11	6.32	0.15
5	To satisfy my mind curiosity about plant species	3.29	3.92	0.53	<b>0.00**</b>
6	To explore the botanical species	3.50	4.22	2.68	<b>0.00**</b>
7	To alleviate boredom from lecture hall	4.05	4.26	4.98	0.47
8	To complete the research and plant portfolio	3.58	4.00	1.51	0.05
9	To think about my ability in taking up the subject	3.57	4.05	3.85	<b>0.04*</b>
10	To experience something new or unusual	4.25	4.42	1.50	0.44
11	To use my mind	3.81	4.26	1.35	0.05
12	To expend my interests and knowledge in plant species	3.68	4.23	8.82	<b>0.00**</b>
13	To be mentally stimulated	3.43	4.15	6.62	<b>0.00**</b>
14	To study or do research	3.52	4.16	1.76	<b>0.00**</b>
15	Do not know what to expect from the visit	2.33	2.51	0.04	0.56

(Source: Author, 2017)

Likert scale:

1 =Not important; 2 =Less important; 3= Moderate Important; 4=Important; 5= Very Important

\*Significant different at  $P < 0.05$

\*\* Highly significant different at  $P < 0.01$

Result for highly significant different at  $p < 0.01$  is found for item 5, "To satisfy my mind curiosity about plant species" with the mean for male respondents is 3.29 and the mean for female respondents is 3.92. Similarly for item 6, 'To explore the botanical species' with the male respondents (mean=3.50 and the female respondents (mean=4.22). Three more items showed highly significant different for the mean values i.e. item 12 (To complete the research and plant portfolio), item 13 (To be mentally stimulated) and item 14 (To study or do research).

The significant different at  $p < 0.05$  is found for answer such as 'To think about my ability in taking up the subject' which showed the male rating mean is 3.57 than the female rating mean is 4.05. Both male and female respondents rated high for item 10 "To experience something new or unusual (mean for male, 4.25 and mean for female, 4.42). Similarly, for item 7, "To alleviate boredom from lecture

hall, the mean values are above 4. The above results concluded that the female respondents rated higher than the male respondents. They also have certain expectations visiting the park, thus making this visit is important to them.

## 5.2 Garden as a Place for Outdoor Learning

The alpha coefficient value for this analysis is 0.8. There are no significant different in the mean comparison between the male and female respondents in their opinion on garden as a place for outdoor leaning except for item 1 "It takes a lot of effort to learn things here" (Table 4). It can be concluded that generally the variables have similar rating values and not depending on the gender factors. However, the lowest mean results is observed for item 5, "Learning here is difficult" for both genders, which indicated that the information provided at the location helped to make the learning process easier and assisting the students in identifying the plants. The male rated lower than the female for all items except for items 3 and 4.

Table 2: Mean comparison between gender on their opinion on garden as a place for outdoor learning

Item	Variables	Male	Female	F	Sig.
1	It takes a lot of effort to learn things here	4.00	4.38	5.02	0.02*
2	Understanding the information presented here is important to me	4.00	4.31	0.29	0.84
3	Learning here is a relaxing thing to do	4.19	4.18	0.34	0.96
4	Learning here is a fun thing to do	4.24	4.18	0.82	0.77
5	Learning here is difficult	2.90	2.61	0.64	0.27
6	The visit or tour is educational to me	3.90	4.23	0.18	0.06
7	The visit or tour is recreational to me	3.95	4.26	1.19	0.10
8	Detailed and clear explanations	3.95	4.18	0.09	0.17
9	Should provide visitors interactive centre to collect information	4.14	4.31	1.34	0.38
10	Should provide additional workshop for hands and activity for visitors to learn more	3.90	4.08	1.94	0.40

(Source: Author, 2017)

Likert scale:

1=Not important; 2=Less important; 3= Moderate Important; 4=Important; 5= Very Important

\*Significant different at  $P < 0.05$

## 5.3 Botanical Park as a Place for Learning Experience

Table 3 represents the mean comparison of the attributes that encouraged the experiential learning activities and the alpha coefficient value is 0.9. The result shows no significant differences for all items. Generally the mean comparison shows that the male rated lower than female in all items except items 5, 6 and 7. The highest rating is for item 9 which stated "I was able to discuss with friends during the outdoor learning session".

Table 3: Mean Comparison on Attributes that Encouraged Experiential Learning in the Park

Item	Variables	Male	Female	F	Sig.
1	The information/displays captured my interest	3.90	3.90	0.05	0.96
2	I became interested in things that didn't previously interest me	3.65	3.79	0.15	0.48
3	Attractive garden flyers and the garden's map encouraged me to explore the garden	3.76	3.87	0.04	0.58
4	The information was presented in an interesting way	3.76	3.87	0.00	0.76
5	I was reminded of something I already knew or had experienced in the lecture hall	4.00	3.95	0.27	0.85
6	Detailed and clear explanation by botanist	3.95	3.92	2.55	0.29
7	I am able to study on my own way such as taking photographs and get closed with the plants	4.10	3.92	2.73	0.00
8	Well organized setting and really encourage the learning activities	3.86	4.33	0.17	0.36
9	I was able to discuss with friends during the outdoor learning session	4.14	4.31	2.58	0.48
10	I had the opportunity to ask questions to botanists and lecturer	3.86	3.97	0.29	0.71
11	The information provided is sufficient	3.90	3.97	0.03	0.05

(Source: Author, 2017)

Likert scale:

1=Not important; 2=Less important; 3= Moderate Important; 4=Important; 5= Very Important

## 5.4 Satisfaction Level by Respondents

Table 4 represents the mean rating by the respondents to show their satisfaction level of the visitation to the park. The alpha coefficient value for the 10 items is 0.9. No significant differences were detected between the male and female respondents for all items. It can be concluded that all of these factors gave similar opinion to the respondents. The female respondents rated highest for item 8 (mean=4.51), "If I had the opportunity, I would like to come back here again" indicated positive opinion on the visitation to the park. Similar pattern is observed for item 4 (mean=4.44) and item 5 (4.38). The male respondents rated items 4, 5, 7, 8 and 10 with the same values (mean=4.0) and highest for item 3, "The visit produced positive effect" with mean value of 4.10.

Table 4: Mean Comparison of Satisfaction Level by Respondents

Item	Variables	Male	Female	F	Sig.
1	I benefited a great deal from this visit	3.90	4.28	5.02	0.02
2	I am able to learn a lot of plant species here	3.71	4.13	0.29	0.08
3	The visit produced positive effect	4.10	4.18	0.34	0.96
4	I love the landscape and garden design	4.00	4.44	0.82	0.77
5	I found the plants arrangement and species are outstanding	4.00	4.38	0.64	0.27
6	I found the garden information is very helpful	3.95	4.18	0.18	0.06
7	I am able to touch, feel and get closed with the plants	4.00	4.33	1.19	0.10
8	If I had the opportunity, I would like to come back here again	4.00	4.51	0.09	0.17
9	I am able to study the plants in more details	3.86	3.97	1.34	0.38
10	Overall, I am satisfied with the visit	4.00	4.26	1.94	0.40

(Source: Author, 2017)

Likert scale:

1 =Not important; 2 =Less important; 3= Moderate Important; 4=Important; 5= Very Important

### 5.5 Respondent's Opinion on Informational Signage and Educational Facilities

Table 5 indicated the results of photograph assessment. The photographs were shown to the respondents and they were asked to rate the photographs using Likert scale from 1 to 5 representing 1 as the lowest scale and 5 is the highest scale. The respondents rated item 5 and 6 as the highest (ranking number 1). The photographs representing tree species with unique characteristics. *Kigelia africana* is a tree with red flower and *Couroupita guianensis* is a tree with a special fruit characteristics. Generally, other photographs were also rated high (mean above 4) except for photograph 2, mean value is 3.98. The dry fruit and seed collection is an effective technique in studying the morphological characteristics in plant sciences and the plant specimen at the herbarium can assist visitors to the park to observe the characteristics of the leaves, flowers and fruits closely. In addition, the plant specimen could help the visitors to learn more about the plant anatomies and reproduction system.

Table 5: Respondent's Opinion on Informational Signage and Educational Facilities

	Variables	N	Mean	Rank
1	The dry fruit and seed collection	59	4.08	6
2	The plant specimen at the herbarium	60	3.98	8
3	Informational board	60	4.02	7
4	Scientific name: <i>Swietenia macrophylla</i> (Mahogany tree)	60	4.37	3
5	Scientific name: <i>Kigelia africana</i> (Sausage tree)	60	4.47	1
6	Scientific name: <i>Couroupita guianensis</i> (Cannonball Tree)	60	4.47	1
7	Heliconia Garden	60	4.35	4
8	Edible garden	60	4.15	5

Likert scale:

### 6.0 Conclusion

Through the literature findings and data analysis, the student learning expectations are influenced by the physical outdoor setting and learning activities. It is supported by research done by Hansen (2012) where, by looking, walking, hearing, touching and smelling the plants at the park, the students will be able to conduct their learning activity successfully. Such approaches improve their learning process and wanting to revisit the park to facilitate the experiential learning. These findings aligned with previous research done by Noriah et al., (2015), Packer (2004) and Peterson (2015) where visitors preferred to garden setting that is rich with information and user-friendly. According to Cooley (2016), a high level of satisfaction and enjoyment during outdoor education could give significant result to learning experience.

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