Factors Influencing Social-Learning Experience in Nearby Pocket Parks On Campus Ground

Sarah Salih

Universiti Putra Malaysia

Sumami Ismail (✉ sarah_alsaadi1990@yahoo.com)

Universiti Putra Malaysia

Nor Atiah Ismail

Universiti Putra Malaysia

Norsidah Ujang

Universiti Putra Malaysia

Nayeem Asif

IIUM

Research Article

Keywords: on-campus pocket parks, on-campus settings, nearby pocket parks, sustainable campus, social-learning experience

Posted Date: January 6th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1194205/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Nearby pockets on campus grounds have become necessary learning sustainable settings to improve the academic experience by promoting outdoor social and learning activities. However, many universities still focus mainly on formal indoor learning and lack outdoor education that meets modern academic outcomes. Therefore, the current study aimed to identify the factors affecting students' social-learning experience in nearby pocket parks on campus ground, focusing on the tropical regions. The current study employed a questionnaire survey conducted in three Malaysian universities to collect data from 408 participants. The results showed various types of influencing factors that affect the social-learning experience in nearby pockets on campus ground, including landscape elements and activities, environmental factors, and access to these spaces. The results also indicated that students' demographics, including gender, education status, and university, influenced the outdoor social-learning experience. The current study contributed information to the development of on-campus sustainable settings for integrating nearby pockets in social interaction and learning activities in order to improve the academic social-learning experience.

1. Introduction

Public spaces and parks are decisive components for human experience and daily life; they satisfy people's need for social interactions and everyday activities^{1,2}. Recently, public open spaces and parks have become necessities that should be nearby and easy accessibility due to their role in people's quality of life^{2,3,4}. They promote different activities amongst different socio-demographic groups of people, contributing to a wide range of health, environmental, aesthetic, socio-cultural, educational, and physical benefits^{2,5}. However, rapid global urbanisation and population growth affect negatively in providing large green spaces. The shrinkage of the natural environment and green spaces, which in turn, influence the environment, climate, human health, social and cultural aspects^{4,6,7}.

Pocket parks which appeared as low-cost, small scale nearby open spaces (less than 5000 square meter) that effectively promote various activities and benefits for different users^{8,9,10}. Nearby pocket parks provide a worthwhile investment in fostering social interaction for urban communities. These small nearby parks are also considered safer and more secure than larger parks⁹. They contribute to sustainable urban development by enhancing natural components and natural energy^{3,11}. Accordingly, Shahhoseini et al.¹² and Tabassum⁹ mentioned that the current global urban authorities are fixating their attention to create and maintain smaller parks rather than large parks. Recently, nearby pocket parks have also been included in enhancing specific communities such as students and adolescent learners^{13,14,15}. Nevertheless, these pockets must be designed with suitable characteristics and factors to obtain the desired benefits^{16,17}. Whereby factors affecting the nearby pocket parks users play a critical role in the success of these parks^{18,19}.

However, the existing evidence shows disagreement on the type of factors affecting pocket parks' users. Nordh and Ostby confirmed that natural components (plants and water), hard elements (benches), and activities are the most frequent factors affecting the nearby pocket parks' usage²⁰. Hussein et al. discussed the sense elements, referring to the elements that stimulate the human five senses, as types of the natural landscape and gardens elements²¹. Environmental factors such as temperature, rain, and shade were also mentioned as parameters of successful urban pocket parks^{10,11,22}. Abd El-Aziz highlighted that nearby pocket parks also provide opportunities for cooperation amongst different parties in pockets' design, construction, and maintenance²³. Furthermore, refreshment facilities (food and drink) and power outlets (connectivity) on-campus ground are critical for promoting students' participation^{24,25}.

On the other hand, nearby open spaces and pocket park settings on campus ground play an essential role as social-learning settings in enhancing multilateral learners' social coherence and learning activities^{26,27,28}. Traditional learning in classrooms alone does not fulfil modern social needs and the learning process^{25,28}. Therefore, nearby pockets on-campus ground has provided a sociable learning space that positively correlates with the increased student social engagement and participation in formal and informal activities^{28,29,30}. Most of the universities worldwide are utilising nearby pockets for social activity, formal and informal learning. However, Malaysian universities focus mainly on formal indoor learning and lack absorption of informal and formal outdoor learning, which disservice the academic aspirations of modern teaching institutions^{24,31}. Nearby outdoor learning spaces in the Malaysian campus ground remain neglected or unexplored^{24,32,33}. Moreover, the research on nearby spaces on campus ground and their design parameters is still limited^{31,34}. Therefore, there is a gap in understanding the factors affecting users' social-learning experience in nearby open spaces (pocket parks) on universities campus ground. The current study aimed to fill the knowledge gap by identifying the factors affecting students' social-learning experience in nearby pocket parks on campus ground, especially in Malaysian and tropical countries.

2. Material And Methods

2.1. Study site

The current study utilised a quantitative survey to investigate students' attitudes to the key factors affecting their social learning on Malaysian campus pocket parks. Malaysia has 20 public universities and 38 private universities that have about 700,000 students' enrolment in different programs³⁵. Creswell recommended selecting the study site based on site selection criteria to obtain accurate data and reduce external validity threats³⁶. Therefore, the study area was selected based on selection criteria using a stratified judgmental sample. These selection criteria included research universities in Kuala Lumpur (in Klang Valley), Malaysia and a sample from architecture and built environment schools (refer Figure 1). There are three research universities in Klang Valley, Malaysia, including Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), and Universiti Putra Malaysia (UPM). The sample was selected from the nearby pocket spaces of the mentioned schools.

University of Malaya (UM) is a public research university located in southwest of Kuala Lumpur, Malaysia (refer Figure 2). The UM set on 900 acres (365 hectares) of natural parkland, hills, and valleys. The UM comprises 12 faculties, two academies, three centres, the main library, banking services, food courts, health services, and sports facilities which are distributed randomly. The Faculty of Built Environment at UM is located southwest of the campus, close to the lake. It is a one-block high building with many floors adjacent to a small pocket park with the size of about 160 square meter³⁷.

Universiti Putra Malaysia (UPM) is a public research university in Malaysia; its main campus is in Serdang, south of the capital Kuala Lumpur, and next to the central capital city Putrajaya. The main campus of UPM covers over 1,000 hectares of land comprising 16 faculties, 16 centres, nine institutes, two schools, and one academy. UPM offers various facilities, including libraries, bookshops, banking services, food courts, and recreational and sporting facilities which are distributed randomly (refer Figure 2). The Faculty of Design and Architecture at UPM is located southeast of the main gate close to the Faculty of Engineering, three km away from the main library³⁸. It is a courtyard building with three floors next to a small pocket park with the size less than 36 square meter. The courtyard pocket park is the central gathering area of the school with the size of about 100 square meter.

Universiti Kebangsaan Malaysia (UKM), also known as The National University of Malaysia, is a public research university in Bandar Baru Bangi, Selangor, 30 km south of Kuala Lumpur (refer Figure 2). The main campus covers a green valley over 1,096 hectares of land, consists of 13 faculties, 16 research institutes, ten residential colleges, ten service centres, and two entities. The Department of Built Environment is located within the Faculty of Engineering Built Environment, southwest of the campus on about 2.30-hectare of land. It is a courtyard building consists of four floors surrounding a courtyard pocket park with the size of about 75 square meter (refer Figure 3)³⁹.

2.2. Study sample

The students of the Malaysian universities were the study population. The current study selected a stratified judgmental sample from architecture and built environment schools of three research universities in Klang Valley, Malaysia (refer Figure 1). According to Taherdoost, the targeted sample should be relevant to the subject of study⁴⁰. Sheriff and Abdullah also confirmed that the students of the research universities in Malaysia have quality knowledge on developing research work and surveys⁴¹. The three universities have more than 73,000 students enrolled in different programs. The sample size of the study was selected using the Simplified Formula of Yamane⁴². Based on the Simplified Formula in Equation 1, a total of 420 questionnaire forms (140 in each university) were distributed in the nearby pocket parks of the selected schools.

$$n = \frac{N}{1 + N(e)^2} = \frac{700000}{1 + 700000(\pm 0.05\%)^2} = \pm 400$$

Equation 1. A Simplified Formula for Proportions (Source: Yamane⁴²).

2.3. Verbal questionnaire and procedure

The verbal questionnaire consisted of three parts, including; a) participants' demographic characteristics (participant variable); b) participants' social-learning experience on-campus ground (dependent variable); c) factors affecting participants in nearby pocket parks on-campus ground (independent variable). The content of the questionnaire was developed after an intensive literature review on the original studies published in indexed journals^{2,14,15,19,24,34,43,44}. The demographic characteristics included age (continuous), gender (1= male and 2= female); ethnicity (1= Malay, 2= Chinese, 3= Indian, and 4= others); education level (Bachelor, Master, PhD, and others).

The outdoor social-learning experience included seven closed-ended questions, four regarding participants' outdoor social interaction and three regarding learning experience in the nearby pocket parks. The social interaction statements measured participants' social activity on

campus, including socialisation (chatting and communication), social recreation, social refreshment (group eating and drinking), and other social activities. The learning experience statements measured the participants' informal group study, individual study, and formal learning activity. The scale of this part was a three-point ratio scale, including 1= never use them, 2= < 30 minutes daily, and 3= $\geq$ 1 hour daily. The average daily time of physical activities in outdoor space should be between 30 and 60 minutes per day to obtain various health and social benefits^{14,15}.

The factors affecting participants in nearby pocket parks included design and image, elements (softscape, hardscape, and sensing elements) and activities, environmental factors (temperature, rain and humidity, wind, sunlight, and shade), access (accessibility and proximity), pocket management (management and maintenance and safety, and security), facilities (connectivity, refreshment, and resources), participation, sociability, and noise level. A 5-point Likert scale was used to assess the factors affecting the participants' use of nearby pocket parks on-campus groups ranged from (1= no effect) to (5= major effect)^{36,44,45}. The connectivity factor referred to the internet access services and power outlets for laptops²⁵. The participation factor referred to users, responsible authorities, and private sectors in the pocket park's design, maintenance, and creation²³. Meanwhile, the resources factor referred to the availability or access to the material such as books, workplace, and board²⁵. The questionnaire survey was self-administered during weekdays between April and July 2019 in the morning (10.00 am to 11.00 am) and afternoon (12.00 pm to 3.00 pm). 408 questionnaire forms were included in the current study; 12 were uncompleted and disincluded in the analysis. On average, the participants answered 15 questionnaires in one day, and each participant took about 10 minutes to complete.

2.4. Validity and reliability of the questionnaire

The questionnaire content was reviewed by a committee of six experts for content validity (readability, clarity, and comprehensiveness) and approving the study protocol. The experts were three associate professors and three PhD lecturers from department of architecture, landscaping, and urban design from the Faculty of Design and Architecture at UPM. The content validity was checked using the Content Validity Index for Items (I-CVI) on the individual items of the questionnaire. The Content Validity Index (CVI) results were higher than 0.80 for the three parts of the questionnaires. These results indicated that the six experts agreed that the questionnaire items were relevant and valid for the survey⁴⁶. A pilot test was then conducted on 24 participants to check the time, the clarity, the language, and the reliability of the questionnaire prior to the data collection stage. The pilot study showed that the respondents took about 10 minutes to answer the questionnaire, and none of the participants commented on the clarity or language issues of the survey. Internal consistency reliability using Cronbach's alpha was conducted on the questionnaire for reliability. The Cronbach's alpha for internal consistency reliability value was 0.82 (> 0.70) for the questionnaire tool. Therefore, the pilot test and the internal consistency reliability showed that the questionnaire was indeed precise and reliable. All the participants have given informed consent before completing the survey or any related procedures.

2.5. Data analysis process

The current study employed frequency and descriptive statistics to analyse the participants' demographic characteristics (participant variables) and social and learning activities on-campus ground (dependent variables). Descriptive statistics were also utilised to analyse the factors affecting users' activity in nearby pocket parks on-campus ground (independent variables). Besides, bivariate analysis of Pearson's correlation was utilised to investigate the bivariate correlation between the study's variables. In addition, multiple regression analyses were conducted to test the multivariate relationships between the overall social-learning experience (dependent variable), the demographic characteristics (participant variable), and the influencing factors in nearby pocket parks (independent variable). The p-value of < 0.05 was taken as significant. Data of the study were analysed using a statistical package for the social sciences (SPSS) version 23, an ideal comprehensive analytical computer tool to analyse social studies data.

3. Results

3.1. Participants' demographic characteristic

Overall, 408 students took part in the survey. The mean age of the respondents was 23.80 ± 10.80 years, with a range between 18 and 40 years. Female participants made up 50.0% (n= 204) of the total samples, which was 1.0% more than male participants who made up 49.0% (n= 203), with one missing answer. Most of the participants (46.8%, n= 191) were Malay, followed by 29.7% (n= 121) Chinese, 14.2% (n= 58) other ethnicities, and only 9.3% (n= 38) of Indian as the smallest group. For education status, most of the participants (46.8%, n= 191) were Bachelor students, followed by 39.0% (n= 159) of Master students, and 14.2% (n= 58) of PhD students (refer Table 1). In addition, most of the participants were from UKM (n= 158, 38.1%), followed by 36.1% (n= 150) from UPM, and 24.1% (n= 100) from UM. The participants' demographic characteristics are presented in Table 1.

Table 1
Frequency statistics of participants' demographic characteristics and social-learning activities.

Variable		Frequency	%	Ranges	Total	Missing
Gender	Male	203	49.0	1-2	407	1
	Female	204	50.0			
Ethnicity	Malay	191	46.8	1-4	408	-
	Chinese	121	29.7			
	Indian	38	9.3			
	Others	58	14.2			
Education status	Bachelor	191	46.8	1-3	408	-
	Masters	159	39.0			
	PhD	58	14.2			
University	UM	100	24.1	1-3	408	-
	UPM	150	36.1			
	UKM	158	38.1			
Socialization	Never use nearby pocket parks	244	59.8	1-3	408	-
	< 30 min daily	151	37.0			
	≥ 1 hour daily	13	3.2			
Social-recreational activity	Never use nearby pocket parks	238	58.3	1-3	408	-
	< 30 min daily	136	33.3			
	≥ 1 hour daily	34	8.3			
Social refreshment activity (eating and drinking)	Never use nearby pocket parks	149	36.5	1-3	408	-
	< 30 min daily	173	42.4			
	≥ 1 hour daily	86	21.1			
Other social activity	Never use nearby pocket parks	216	52.9	1-3	408	-
	< 30 min daily	153	37.5			
	≥ 1 hour daily	39	9.6			
Informal group study	Never use nearby pocket parks	273	66.9	1-3	408	-
	< 30 min daily	123	30.1			
	≥ 1 hour daily	12	2.9			
Informal individual study	Never use nearby pocket parks	196	48.0	1-3	408	-
	< 30 min daily	160	39.2			
	≥ 1 hour daily	52	12.7			
Formal learning activity	Never use nearby pocket parks	247	60.5	1-3	408	-
	< 30 min daily	130	31.9			

Variable	Frequency	%	Ranges	Total	Missing
≥ 1 hour daily	31	7.6			

3.2. Social learning activities and pocket parks' influencing factors

The frequency and descriptive analysis of the students' social interaction in the nearby pocket parks on Malaysian campus ground showed that most of the participants never used the on-campus pocket parks for socialisation (59.8%, n= 244), social recreation (58.3%, n= 238), and other social activities (52.9%, n= 216). About 79% (n= 322) of the participants' used the nearby pocket parks with less than 30 minutes per day for social refreshments (eating or drinking activity with others) (refer Table 1 and Table 2). However, less than 10% of the participants used the on-campus pocket parks one hour or more per day for socialisation (3.2%, n= 13), social recreation (8.3%, n= 34), or other social activities (9.6%, n= 39). Furthermore, most participants never used the on-campus pocket parks for informal group study (66.9%, n= 273) and formal learning (60.5%, n= 247). Meanwhile, less than 8% of them practised informal group study (2.9%, n= 12) and formal learning (7.6%, n= 31) in the nearby pocket parks for one hour or more, daily. In addition, about half of the participants (48%, n= 196) never used the on-campus pocket parks for individual informal study, and only 12.7% of them used these spaces for one hour or more daily. These results indicated that most participants either do not use the nearby pocket parks in the Malaysian universities or use them for less than 30 minutes per day for various social and learning activities.

The descriptive statistics of the factors affecting students in the nearby pocket parks on Malaysian campus ground showed that the highest mean score was registered for the shade factor (4.14 ± 0.815). Followed by mean scores of rain and humidity (4.03 ± 0.945), hardscapes ($4.01 \pm .902$), connectivity (3.96 ± 1.036), temperature (3.93 ± 1.000), refreshment ($3.92 \pm .959$), resources ($3.92 \pm .972$), sociability ($3.85 \pm .857$), participation (3.74 ± 1.030), sunlight (3.64 ± 1.044), accessibility (3.61 ± 1.044), and maintenance (3.60 ± 1.098). The descriptive statistics in Table 2 also showed significant mean scores for factors of sense element ($3.55 \pm .902$), softscape (3.55 ± 1.030), design and image (3.55 ± 1.062), noise level (3.52 ± 1.066), safety and security (3.50 ± 1.135), activity ($3.49 \pm .984$), and proximity ($3.43 \pm .999$). However, the lowest mean score was registered for the wind factor (3.22 ± 1.138). These results indicated that the most influential factors in the on-campus pocket parks were shade, rain and humidity, hardscape, connectivity, temperature, refreshment, resources, sociability, participation, sunlight, accessibility, maintenance, sense element, softscape, and design and image, respectively. Factors of noise level, safety, activity, proximity, and wind neutrally affected (have less effect) on the students' activities in the on-campus pocket parks.

3.3. Bivariate correlation for the demographic, social learning, and pockets' influencing factors

Pearson's correlation was used to test the bivariate relationship between individual (social and learning) activities and each factor of nearby pocket parks and demographic variables, as shown in Table 2 and Table 3. Pearson's correlation showed a significant correlation between various social activities on-campus ground and design and image, element and activity, environmental factors (except wind), access, pocket management, facilities (except refreshment), sociability, participation, and noise level ($p < 0.05$, refer Table 2). It also showed a significant correlation between various learning activities on-campus ground and hardscape elements, activities, environmental factors (except sunlight and wind), proximity, connectivity, sociability, participation, and noise level ($p < 0.05$, refer Table 3). Most importantly, temperature, rain and humidity, shade, and sociability factors affected all types of social activities. Temperature and shade were also the factors influencing all learning activities.

Furthermore, there was a significant association between social activities on-campus ground and most demographic characteristics of participants, including ethnicity, education status, and university ($p < 0.05$, refer Table 2). Pearson's correlation also showed a significant association between on-campus learning activities and participants' demographic variables ($p < 0.05$, refer Table 3). These results indicated that different factors could affect the students' social and learning activities in nearby pocket parks on Malaysian campus ground, including site, environmental, and demographic characteristics.

Table 2

Descriptive and bivariate analysis for the demographic characteristics, social activities, and pocket parks' influencing factors.

Variables			Mean ± SD	Values	1	2	3	4	5	6	7	8
1	Social Interaction	<i>Socialization</i>	1.43 ± .557	(1-3) ^{***}	-	-	-	-				
2		<i>Social recreation</i>	1.50 ± .646	(1-3) ^{***}	-	-	-	-				
3		<i>Social refreshment</i>	1.85 ± .744	(1-3) ^{***}	-	-	-	-				
4		<i>Other social activity</i>	1.57 ± .662	(1-3) ^{***}	-	-	-	-				
5	Gender		-	-	-.050	.006	-.049	-.010	-			
6	Ethnicity		-	-	-.179 ^{**}	-.188 ^{**}	-.226 ^{**}	-.221 ^{**}	-.109 [*]	-		
7	Education Status		-	-	-.287 ^{**}	-.265 ^{**}	-.286 ^{**}	-.281 ^{**}	-.110 [*]	.505 ^{**}	-	
8	University		-	-	.123 [*]	.165 ^{**}	.080	.252 ^{**}	.003	-.088	-.111 [*]	-
9	Design and Image		3.55 ± 1.060		.035	-.149 ^{**}	.100	-.082	.110 [*]	-.087	-.037	-.020
10	Elements and Activities	<i>Softscape</i>	3.55 ± 1.030	(1-5) ^{****}	.064	-.191 ^{**}	.085	-.049	.055	-.150 ^{**}	-.020	-.043
11		<i>Hardscape</i>	4.01 ± .902	(1-5) ^{****}	-.158 ^{**}	-.129 ^{**}	-.006	-.114 [*]	.046	.019	.069	-.106 [*]
12		<i>Sense elements</i>	3.55 ± .902	(1-5) ^{****}	-.053	-.145 ^{**}	.027	-.145 ^{**}	.028	-.061	.010	-.030
13		<i>Activity</i>	3.49 ± .984	(1-5) ^{****}	-.158 ^{**}	-.199 ^{**}	-.070	-.222 ^{**}	.054	.036	.090	-.110 [*]
14	Environmental Factors	<i>Temperature</i>	3.93 ± 1.000	(1-5) ^{****}	-.185 ^{**}	-.284 ^{**}	-.151 ^{**}	-.259 ^{**}	.022	.019	.142 ^{**}	-.037
15		<i>Rain and humidity</i>	4.03 ± .945	(1-5) ^{****}	-.108 [*]	-.233 ^{**}	-.130 ^{**}	-.211 ^{**}	.101 [*]	.074	.175 ^{**}	-.006
16		<i>Wind</i>	3.22 ± 1.138	(1-5) ^{****}	.057	-.097	.092	-.016	.021	-.065	-.025	.040
17		<i>Sunlight</i>	3.64 ± 1.044	(1-5) ^{****}	.059	-.228 ^{**}	.030	-.081	.041	-.027	.006	.023
18		<i>Shade</i>	4.14 ± .814	(1-5) ^{****}	-.172 ^{**}	-.232 ^{**}	-.244 ^{**}	-.321 ^{**}	.000	.174 ^{**}	.206 ^{**}	-.031
19	Access		3.61 ± 1.044	(1-5) ^{****}	-.098 [*]	-.220 ^{**}	.044	-.120 [*]	.082	-.023	-.035	-.031

Variables			Mean ± SD	Values	1	2	3	4	5	6	7	8
20		Proximity	3.43 ± .999	(1-5)****	.058	-.166**	.087	-.135**	.080	-.037	-.005	-.022
21	Pocket Management	Management and maintenance	3.60 ± 1.098	(1-5)****	.055	-.237**	.038	-.158**	.023	-.097	.042	-.084
22		Safety and security	3.50 ± 1.135	(1-5)****	-.115*	-.131**	.036	-.113*	.040	-.111*	-.038	-.011
23	Facilities	Connectivity	3.96 ± 1.036	(1-5)****	-.031	-.106*	-.168**	-.135**	.100*	-.033	.040	-.171**
24		Refreshment	3.92 ± .959	(1-5)****	-.035	-.073	-.006	-.075	-.023	-.009	.032	-.113*
25		Resources	3.92 ± .972	(1-5)****	-.034	-.127*	-.006	.002	.033	-.062	.014	.140**
26	Sociability		3.85 ± .857	(1-5)****	-.206**	-.253**	-.151**	-.256**	.058	.072	.167**	-.068
27	Participation		3.74 ± 1.030	(1-5)****	-.009	-.037	-.079	-.133**	.079	-.090	-.031	-.240**
28	Noise level		3.52 ± 1.066	(1-5)****	.194**	-.126*	.155**	.043	.104*	-.106*	-.112*	.056
Note: The table reports Pearson's correlations.												
* <i>P</i> < 0.05 (2-tailed).												
** <i>P</i> < 0.01 (2-tailed).												
Values: *** (1= Never use NOS; 2= < 30 min daily; 3= ≥ 1 hour daily)												
Values: **** (1 = No affect; 2 = Minor affect; 3 = Neutral; 4 = Moderate affect; 5 = Major affect)												

Table 3

Descriptive and bivariate analysis for the demographic characteristics, learning activities, and pocket parks' influencing factors.

Variables			Mean ± SD	Values	1	2	3	4	5	6	7
1	Learning Experience	Informal group study	1.36 ±.539	(1-3)***	-	-	-				
2		Informal individual study	1.65 ±.696	(1-3)***	-	-	-				
3		Formal learning activity	1.47 ±.634	(1-3)***	-	-	-				
4	Gender				-.098*	-.175**	.006	-			
5	Ethnicity				-.102*	-.127*	-.192**	-.109*	-		
6	Education Status				-.296**	-.228**	-.253**	-.110*	.505**	-	
7	University				.123*	.142**	.241**	.003	-.088	-.111*	-
8	Design and Image				-.001	.056	-.011	.110*	-.087	-.037	-.020
9	Elements and Activities	Softscape			.057	.058	.042	.055	-.150**	-.020	-.043
10		Hardscape			-.127*	-.078	-.122*	.046	.019	.069	-.106*
11		Sense element			.029	.038	.039	.028	-.061	.010	-.030
12		Activity			-.132**	-.068	-.109*	.054	.036	.090	-.110*
13	Environmental Factors	Temperature			-.246**	-.122*	-.139**	.022	.019	.142**	-.037
14		Rain and humidity			-.122*	-.186**	-.093	.101*	.074	.175**	-.006
15		Wind			.093	.053	.053	.021	-.065	-.025	.040
16		Sunlight			.023	-.001	.001	.041	-.027	.006	.023
17		Shade (natural/artificial)			-.194**	-.147**	-.190**	.000	.174**	.206**	-.031
18	Access	Accessibility			.046	.068	.025	.082	-.023	-.035	-.031
19		Proximity			-.120*	-.101*	.042	.080	-.037	-.005	-.022
20	Pocket Management	Management and maintenance			.056	.044	-.040	.023	-.097	.042	-.084
21		Safety and security			.095	.072	.007	.040	-.111*	-.038	-.011
22	Facilities	Connectivity			-.059	-.124*	-.196**	.100*	-.033	.040	-.171**
23		Refreshment			.006	.015	-.046	-.023	-.009	.032	-.113*
24		Resources			.057	.055	.074	.033	-.062	.014	.140**
25	Sociability				-.146**	-.075	-.008	.058	.072	.167**	-.068
26	Participation				-.062	-.110*	-.193**	.079	-.090	-.031	-.240**
27	Noise level				.074	.162**	.109*	.104*	-.106*	-.112*	.056

Variables	Mean ± SD	Values	1	2	3	4	5	6	7
<p>Note: The table reports Pearson's correlations.</p> <p>*$P < 0.05$ (2-tailed).</p> <p>**$P < 0.01$ (2-tailed).</p> <p>Values: *** (1= Never use NOS; 2= < 30 min daily; 3= ≥ 1 hour daily)</p>									

3.4. Multivariate relationship for the demographic, social learning, and pockets' influencing factors

Two steps of multiple regression analysis were used to predict the students' social-learning experience (overall dependent variable) based on the factors of nearby pocket parks on Malaysian campus ground (independent variable) and participant variables. The social-learning experience refers to the sum of the social and learning activities (dependent variable). Only the significant factors from the bivariate stage were included in the regression analyses, including a) design and image factor; b) the sum of elements and activities scores; c) the sum of environmental factors scores (temperature, rain and humidity, sunlight, and shade); d) the sum of access scores; e) the sum of pocket management scores; f) the sum of facilities scores (connectivity and resources); g) sociability; h) participation; and i) noise level. Firstly, a multiple regression analysis was conducted for the demographic characteristics with the outdoor social-learning experience, as shown in Model 1 (Table 4). Model 1 showed a significant result that explained 22.6% of the variance in social-learning experience ($R^2 = 0.226$, $F = 29.166$, $P < 0.001$). It produced a statistically significant association between gender ($\beta = -0.136$, $P < 0.01$), education status ($\beta = -0.356$, $P < 0.001$), university ($\beta = 0.194$, $P < 0.001$) and outdoor social-learning experience (refer Table 4).

Table 4

Multivariate analysis to predict social-learning experience based on pocket parks' influencing factors and demographic characteristics.

Variables		Model 1		Model 2	
		Standardized Coefficients	Sig.	Standardized Coefficients	Sig.
Influencing Factors	(Constant)		.000***		.000***
	Gender	-.136	.002**	-.131	.002**
	Ethnicity	-.085	.098	-.079	.109
	Education Status	-.356	.000***	-.272	.000***
	University	.194	.000***	.172	.000***
	Design and Image			.087	.093
	Elements and Activities			-.119	.030*
	Environmental Factors			-.244	.000***
	Access			-.138	.017*
	Pocket Management			-.017	.779
	Facilities			-.051	.311
	Sociability			-.092	.065
	Participation			-.005	.924
	Noise Level			.143	.006**
	Dependent Variable: Outdoor social-learning experience. Model 1: R= 0.476, R ² = 0.226, F= 29.166. Model 2: R= 0.570, R ² = 0.325, F= 14.443.				
*P < 0.05.					
**p < 0.01.					
***p < 0.001.					

Secondly, the combined significant values of the factors affecting the students' activity in nearby pocket parks were included in the multiple regression analysis to predict outdoor social-learning experience, as shown in Model 2 (Table 4). The second step increased the fit of the model (Model 2) and showed that including factors of pocket parks contributed 32.5% of the variance in outdoor social-learning experience ($R^2 = 0.325$, $F = 14.443$, $P < 0.001$). Model 2 showed a statistically negative association between elements and activities ($\beta = -0.119$, $P < 0.05$), environmental factors ($\beta = -0.224$, $P < 0.001$), access ($\beta = -0.138$, $P < 0.05$) and social-learning experience in nearby pocket parks (refer Table 4). These results indicated that students who lacked social-learning experience on Malaysian campus grounds were affected by elements and activities, environmental factors, and access to nearby pocket parks. However, a significant positive association between noise level factor and social-learning experience ($\beta = 0.143$, $P < 0.01$) indicated that students who lacked social-learning experience in nearby pocket parks were positively affected by the noise level.

Model 2 also significantly correlated students' gender, education status, university and outdoor social-learning experience on-campus grounds ($P < 0.01$). This result indicated that students from different demographic backgrounds (including gender, education status, and university) have different levels of social-learning experience in nearby open spaces. In summary, elements and activities (including softscape, hardscape, sense elements, and activities), environmental factors (including temperature, rain and humidity, sunlight, and shade), access (including accessibility and proximity), gender, education status, and university were significant predictors of social-learning experience in nearby pocket parks on Malaysian campus ground.

4. Discussion

The current study aimed to identify the factors influencing students' social-learning experience in nearby pocket parks on Malaysian campus ground. The results of multiple regression analysis suggested that various types of landscape elements (softscape, hardscape, sense elements) and activities, environmental factors (temperature, rain and humidity, sunlight, and shade), access (accessibility and proximity), and noise level were the most influential factors in the social-learning experience in nearby pocket parks on Malaysian campus ground (refer Figure 4). This finding contributed to the existing results reported by Ibrahim and Fadzil²⁵. They confirmed that outdoor spaces in or close to an educational institution should provide various elements and activities to enhance the students' usage. Besides, the result reported by Kim and Lee confirmed that outdoor learning spaces on-campus ground designed with proper components and elements could contribute to shared places for social learning⁴⁷.

However, the result of the current study showed that most of the students lack various social and learning activities in nearby pocket parks of on-campus ground. This finding was consistent with Malaysia's evidence, highlighting that Malaysian universities focus mainly on formal indoor learning and lack of outdoor and informal learning^{24,31}. This may be due to the existing condition of the nearby open spaces in the Malaysian universities, which lacks the proper design attributes, especially the environmental and hardscape elements^{25,31,33}. Most of the students who lack daily social and learning activities were affected negatively by the different factors of pocket parks in Malaysian universities, except the noise level factor. The noise factor positively affected the outdoor social-learning experience, this might be due to low noise level in the existing on-campus pocket parks. Yet, the students need to engage in outdoor activities in the nearby pocket parks to reap the social, physical, and health benefits^{14,25}. Therefore, would improve the current condition of nearby pocket parks on Malaysian campus ground in terms of elements and activities, environmental factors, and easy access which contribute to promoting the students' social-learning experience.

The bivariate analysis of the current study showed that individual social and learning activities on-campus ground were influenced by a wide range of design, social and environmental factors. Design and image, elements and activities, environmental factors, access, pocket parks management, facilities, participation, sociability, and noise level were affecting the students' social interaction on-campus ground. Students' outdoor learning activities were also influenced by the hardscape elements and activities, environmental factors, proximity, noise level, connectivity, participation, and sociability (refer Figure 4). Sociability and environmental factors (including temperature, rain and humidity, and shade) showed a critical effect on all types of social interaction. Temperature and shading also significantly affected the formal and informal learning activities in nearby open spaces on Malaysian campus ground. These findings contributed to the existing literature which confirmed that environmental factors such as temperature, rain, and shading play a critical role in using nearby open spaces, especially in hot and tropical climates^{11,23}. Similarly, existing studies also mentioned that successful pocket parks should be designed with a variety of softscape, hardscapes, activities, easy access, maintenance, safety, and sociability^{19,41,48,49}.

The multivariate analysis findings showed that students' gender, education status, and university were also predictors of students' social-learning experience in nearby open spaces in Malaysian universities (refer Figure 4). In terms of individual activities, the bivariate analysis showed that students' social interaction and formal learning activities were significant associated with their ethnicity, education status, and university. At the same time, the informal learning experience was significantly related to different demographics (including gender, ethnicity, education status, and university). These findings indicated that students from different backgrounds have different levels of social-learning experience in nearby open spaces. This result is in line with the systematic review reported by Kerishnan and Maruthaveeran¹⁰. The participants' factors such as age, gender, education, and ethnicity might influence the participation level in pocket parks. However, a survey study reported by Salih et al. found a relatively homogenous social activity across different demographic variables of participants¹⁹. One possible explanation for these different results is the cultural aspect of users, where the current study involved participants from various social and cultural backgrounds (multi ethnicities). However, regardless of students' factors, on-campus pocket parks and their design and environmental aspects play a critical role in preventing or enhancing the social-learning experience.

Therefore, nearby pocket parks that consider physical, social, environmental, personal factors are critical in enhancing students' social-learning experience on Malaysian and tropical campuses. The limitation of the current study included, first, the sampling selection, where the stratified judgmental sample reflected the opinions of 408 respondents from the architecture and built environments schools of three public research universities in Malaysia to represent the views of the whole academic community; therefore, the findings must be dealt with carefully. Secondly, this study investigated four social and three learning activities to indicate the social-learning experience on campus. Overall, users of pocket parks could have a wide range of activities and benefits^{14,15,19}. Thirdly, the current study only included four demographic characteristics, including gender, ethnicity, education status, and university. The evidence from the existing studies confirmed that users' factors such as age, income level, and occupation also influence their activities and use of nearby open space^{10,49,50,51}. However, it was not possible within the current study to include more items as the additional items could increase the

burden on the respondents. Therefore, the current study recommended a further study that investigates a comprehensive relationship between pocket parks and users' usage, activities, and demographic variables, mainly because the nearby pocket parks are integral for the students' academic life.

Despite the limitations mentioned above, the current study contributed to the theoretical framework of designing responsive on-campus pocket parks that contribute to sustainable campuses and enhance the outdoor experiences of the academic community in Malaysia and tropical regions. This study highlighted the significant factors that are affecting the on-campus social-learning experience. University development committee should provide an interactive natural environment such as nearby pocket parks to enhance the students' social interaction and engage with nature for a healthy, sustainable academic life.

5. Conclusion

Nearby pocket parks are urban landscape settings that provide a low-cost, small-scale, nearby open space, contribute many social, health, sustainable, and well-being benefits for the nearby communities. Recently, outdoor social learning settings, including nearby open spaces and pocket parks, have become equally important as formal learning spaces to improve the social learning experience and achieve learning outcomes. The current study suggested that pocket parks designed with proper characteristics, including softscape, hardscape, sense elements, activities, easy proximate access, shading elements, sunlight, and protection from high temperature, rain and humidity, are essential to enhance the students' social-learning experience on tropical campuses. The students' social learning participation level in nearby pocket parks might vary based on their demographic variables, including gender, ethnicity, education status, and university. Successful on-campus pocket parks that are designed with good design aspects respond better to the campus context and meet the academic community's needs for social interaction, learning activities, and multiple benefits. Therefore, the current study briefly highlighted the significant factors in on-campus pocket parks and their role in enhancement nearby urban academic communities.

Declarations

ACKNOWLEDGMENT

This research was conducted under FRGS Grant, Universiti Putra Malaysia (Ref: FRGS/1/2019/SS04/UPM/02/2).

PERMISSIONS

A committee of experts including (Assoc. Prof. Dr. Mohd. Fairuz Shahidan, LAr. Dr. Mohd Kher Hussein, Ts. Dr. Sreetheran Maruthaveeran, Ms. Ida Suriana Ismail, and Ts. Dr. Rosalam Che Me) and responsible authorities at the Faculty of Design and Architecture, Universiti Putra Malaysia checked and approved the study protocols (Ref: UPM/FRSB/GS50885). All participants also gave consent before applying the survey or any related procedure.

Declarations

All authors declared that the research was carried out in accordance with relevant guidelines and regulations.

References

1. Giddings, B., Charlton, J., & Horne, M. Public squares in European City Centers. *Urban Design International*. **16**, 202–212 (2011).
2. Currie, M. A. A design framework for small parks in ultra-urban, metropolitan, suburban and small town settings. *Urban Design*. **22**, 76–95 (2016).
3. Douglas, O., Lennon, M., & Scott, M. Green space benefits for health and well-being: A life-course approach for urban planning, design and management. *Cities*. **66**, 53–62 (2017).
4. Roberts, H., McEachan, R., Margary, T., Conner, M., & Kellar, I. Identifying Effective Behavior Change Techniques in Built Environment Interventions to Increase Use of Green Space: A Systematic Review. *Environment and Behavior*. **50**, 28–55 (2018).
5. White, M. P., Elliott, L. R., Grellier, J. et al. Associations between green/blue spaces and mental health across 18 countries. *Scientific Reports*. **11**, 8903 (2021). <https://doi.org/10.1038/s41598-021-87675-0>

6. Moulay, A., Ujang, N., & Said, I. Legibility of neighborhood parks as a predictor for enhanced social interaction towards social sustainability. *Cities*. **61**, 58–64 (2017).
7. Peng, MH., Hung, YC., Liu, KL. et al. Landscape configuration and habitat complexity shape arthropod assemblage in urban parks. *Scientific Report*. **10**, 16043 (2020). <https://doi.org/10.1038/s41598-020-73121-0>
8. Baur, J. W., & Tynon, J. F. Small-Scale Urban Nature Parks: Why Should We Care? *Leisure Sciences*. **32**, 195–200 (2010).
9. Tabassum, S. Environmental Response of Small Urban Parks in Context of Dhaka City. *Journal of Physics*. **953**, 1–19 (2018).
10. Kerishnan, P. B., & Maruthaveeran, S. Factors contributing to the usage of pocket parks—A review of the evidence. *Urban Forestry & Urban Greening*. **58**. 126985 (2021).
11. Lau, S. S., Lin, P., & Qin, H. A preliminary study on environmental performances of pocket parks in high-rise and high-density urban context in Hong Kong. *International Journal of Low-Carbon Technologies*. **7**, 215–225 (2012).
12. Shahhoseini, H., Kamal, B. K., & Maulan, S. Visual preferences of small urban parks based on spatial configuration of place. *International Journal of Architectural Engineering & Urban Planning*, **25**, 84–93 (2015).
13. Towers, D., & Lynch, J. What kind of outdoor educator do you want to become? Trying something different in outdoor studies in higher education. *Journal of Hospitality, Leisure, Sport & Tourism Education*. **21**, 117–121 (2017).
14. Hecke, L. V. et al. Park characteristics preferred for adolescent park visitation and physical activity: A choice-based conjoint analysis using manipulated photographs. *Landscape and Urban Planning*. **178**, 144–155 (2018).
15. Mertens, L., Van Cauwenberg, J., Veitch, J., Deforche, B., & Van Dyck, D. Differences in park characteristic preferences for visitation and physical activity among adolescents: A latent class analysis. *PLOS ONE*. **14**, e0212920 (2019).
16. Peker, E., & Ataöv, A (2019). Exploring the ways in which campus open space design influences students' learning experiences. *Landscape Research*. **45**, 1–17 (2019).
17. Song, X. P., Richards, D. R. & Tan, P. Y. Using social media user attributes to understand human–environment interactions at urban parks. *Sci Rep*. **10**, 808 (2020). <https://doi.org/10.1038/s41598-020-57864-4>
18. Peschardt, K. K., Schipperijn, J., & Stigsdotter, U. K. Use of Small Public Urban Green Spaces (SPUGS). *Urban Forestry & Urban Greening*, **11**. 235–244 (2012).
19. Salih, S. A., Ismail, S., & Mseer, A. Pocket parks for promoting social interaction among residents of Baghdad City. *Archnet-IJAR*. **14**, 393–408 (2020).
20. Nordh, H., & Ostby, K. Pocket parks for people: A study of park design and use. *Urban Forestry and Urban Greening*. **12**, 12–17 (2013).
21. Hussein, H., Omar, Z., & Ishak, S. A. Sensory Garden for an Inclusive Society. *Asian Journal of Behavioural Studies*. **1**, 33–43 (2016).
22. Peschardt, K. K., & Stigsdotter, U. K. Evidence for Designing Health Promoting Pocket Parks. *ArchNet – IJAR*. **8**, 149–164 (2014).
23. Abd El-Aziz, N. A. Potentials of creating pocket parks in high-density residential neighborhoods: The case of Rod El Farag, Cairo city. *International Journal of Development and Sustainability*. **4**, 805–824 (2015).
24. Ibrahim, N., Fadzil, N. H., & Saruwono, M. Learning outside Classrooms on-Campus Ground: Malaysia. *Asian Journal of Environment-Behaviour Studies*. **4**, 97–109 (2013).
25. Ibrahim, N., & Fadzil, N. H. Informal Setting for Learning on Campus: Usage and Preference. *Procedia - Social and Behavioral Sciences*. **105**, 344–351 (2013).
26. Oblinger, D. Leading the Transition from Classrooms to Learning Spaces. *Education Quarterly Journal*. **1**, 14–18 (2005).
27. Rea, T. Informal learning outdoors in *Perspectives on Participation and Inclusion: Engaging Education* (ed, Gibson, S., & Haynes, J.) 122–131 (Continuum, 2009).
28. Keppell, M., Souter, K., & Riddle, M. *Physical and Virtual Learning Spaces in Higher Education: Concepts for the Modern Learning Environment*. (IGI Global, 2011).
29. Matthews, K. E., Andrews, V., & Adams, P. Social learning spaces and student engagement. *Higher Education Research & Development*. **30**, 105–120 (2011).
30. Neely, A. D., & Marone, V. Learning in parking lots: Affinity spaces as a framework for understanding knowledge construction in informal settings. *Learning, Culture and Social Interaction*. **11**, 58–65 (2016).
31. Maheran, Y., Fadzidah, A., Fadhilah, R., & Farha, S. A Review of Criteria for Outdoor Classroom in Selected Tertiary Educational Institutions in Kuala Lumpur. *Materials Science and Engineering*. **291**, 1–7 (2017).
32. Tahir, M. M. et al. Constructing place and space in the design of learning environments for PBL in Malaysian universities. *Journal of Teaching and Learning in Higher Education*. **1**, 26–34 (2009).

33. Zanariah, K., & Norsidah, U. Perception towards Sustainability Polytechnic Campus in Malaysia. *Alam Cipta Journal*. **7**, 15–26 (2014).
34. Shamsudin, S., Ismail, S., Nordin, S., & Al-Mamun, A. Examining the Effect of Extracurricular Activities on Academic Achievements among the Public University Students in Malaysia. *Asian Social Science Journal*. **10**, 171–177 (2014).
35. Da Wan, C., Sirat, M., & Razak, D. The Idea of a University: Rethinking the Malaysian Context. *Humanities*. **4**, 266–282 (2015).
36. Creswell, J. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. (SAGE Publications, 2014).
37. UM, 2019. *About University Malaya*. Universiti Malaya. <https://www.um.edu.my/>. (Accessed 11 September 2019).
38. UPM, 2019. *Universiti Putra Malaysia: Prospectus 2018 - 2019*. University Putra Malaysia. upm.edu.my/. (Accessed 16 September 2019).
39. UKM, 2019. *About: History Background. Bangi: Faculty of Engineering and Built Environment, UKM*. Universiti Kebangsaan Malaysia. <https://www.ukm.my/jurutera/history-background-2/>. (Accessed 15 November 2019).
40. Taherdoost, H. Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *International Journal of Academic Research in Management*. **5**, 18–27 (2016).
41. Sheriff, N. M., & Abdullah, N. Research Universities in Malaysia: What Beholds? *Asian Journal of University Education*. **13**, 35–50 (2017).
42. Yamane, T. *Statistics: An Introductory Analysis* (Harper and Rao, 1973).
43. Nordh, H., Alalouch, C., & Hartig, T. Assessing restorative components of small urban parks using conjoint methodology. *Urban Forestry & Urban Greening*. **10**, 95–103 (2011).
44. De Vaus, D. *Surveys in Social Research* (Routledge, 2013).
45. Kaplan, R., & Kaplan, S. *The experience of nature: A psychological perspective* (Cambridge University Press, 1989).
46. Shrotryia, V. K., & Dhanda, U. Content Validity of Assessment Instrument for Employee Engagement. *SAGE Open*. **9**, 1–7 (2019).
47. Kim, Y. L., Lee, & S. M. Effect of Satisfaction in Major at University on Academic Achievement among Physical Therapy Students. *Journal of Physical Therapy Science*, **27**, 405–409 (2015).
48. Abd El Aziz, N. Pocket park design in informal settlements in Cairo City, Egypt. *Landscape Architecture and Regional Planning*. **2**, 51–60 (2017).
49. Salih, S. A., & Ismail, S. Determining the Factors Affecting Social Interaction in the Parks of Baghdad City, Iraq. *Archnet-IJAR*. **12**, 40–52 (2018).
50. Gibson, S. C. "Let's go to the park" an investigation of older adults in Australia and their motivations for park visitation. *Landscape and Urban Planning*. **180**, 234–246 (2018).
51. Salih, S.A., & Ismail, S (2017). Means to Achieve Social Interaction in Green Open Space in Baghdad, Iraq. *Built Environment, Technology and Engineering*. **2**, 159–167 (2017).

Figures

Figure 1

The selection process of the stratified judgmental sample of the study.

Figure 2

Location of the study sites within West Malaysia. **(a)** University of Malaya. **(b)** Universiti Putra Malaysia. **(c)** Universiti Kebangsaan Malaysia. **(d)** Faculty of Built Environment. **(e)** Faculty of Design and Architecture.

Figure 3

The Selected Pocket Parks. **(a)** Nearby Pocket Park, Faculty of Built Environment, University of Malaya. **(b)** Courtyard Pocket Park, The Faculty of Design and Architecture, Universiti Putra Malaysia. **(c)** Courtyard Pocket Park, Faculty of Engineering Built Environment, Universiti Kebangsaan Malaysia.

Figure 4

Factors influencing the social-learning experience in pocket parks of Malaysian universities.