

## Students' Informal Learning Space Choices at University Campus

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**Abstract:** The increased popularity of collaborative and problem-based learning has changed the learning landscape where the process need not be conducted solely in the classroom. With the changes in teaching pedagogy and increased demand for independence from learners, informal learning spaces aside from the library has become increasingly importance. Despite evolution in higher education learning, most university buildings are deemed to be unsuitable to accommodate diversifying needs of learners. In addition, students' voice is often neglected in designing learning spaces. This study investigated the choice and usage of informal learning space among students' in relation to their learning activities. Survey outcome revealed that the most preferable learning space is hostel, followed by academic building and library. Furthermore, hostel is an ideal study space for students who work best in quiet, closed conditions, both individually and collaboratively. In terms of learning space attributes, comfortability (physical dimension) appeared as the dominant factor, followed by autonomy or control (social dimension) and availability of ICT facilities (physical dimension). The outcome of survey provides guidelines for focus group studies, which leads to a practical guide and a design layout for redeveloping or redesigning informal learning spaces in the campus.

**Key words:** *Learning space preference, Individual study activities, Collaborative study activities, Physical dimension, Social Dimension.*

### INTRODUCTION

Traditionally, university campuses were designed with lecture halls, classrooms and laboratories to accommodate formal teaching and learning activities. However, the uprising trend towards collaborative and problem-based learning has changed approaches to learning in terms of infrastructure, technology, and techniques. In other words, modern learning need not be going on purely in the classroom and it is important for educators to acknowledge the importance of where students actually learn. The younger generation learners prefer to create their own space for learning, thus getting the right types of space to accommodate a variety of learning activities is crucial. With the changes in teaching pedagogy and increased demand for independence from learners, informal learning spaces aside from the library has become increasingly importance. Informal learning is defined as “course-related activity undertaken individually and collaboratively on campus that occurs outside the classroom and does not directly involve the classroom

teacher” [1]. Thus, informal learning consists of a wide range of activities including intense revision, quiet discussions with members, reading, group work and socialising [2]. Despite evolution in higher education learning, most educational buildings are still rather traditional as universities have not committed significant resources to suit this pedagogical concept. As the provider of physical infrastructure, universities need to contemplate more about the spatial demands of individual and social learning. As echoed by Fischer and Newton [3], new space designs should go in line with new ways of teaching and learning. It is necessary that both informal open areas and quiet learning are provided parallel with traditional classroom. On the question of how campus learning spaces should be configured and designed, Oblinger [4] stated that it is essential to understand where students learn, when they use the space and whether they use classrooms beyond class hours. Similar view is shared by Rudd, Gifford, Morrison and Facer [5] where they believed that learners should be given greater choice in terms of when they learn, where they learn, what they learn, who they learn

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with and how they learn. However, the students' voice is often neglected in such research [6]. Although there are numerous studies on informal learning setting in Malaysia (e.g. [7-9], there is still a lack of understanding of student's preferences particularly from learners' perspective. Therefore the purpose of this study is to investigate the choice and usage of informal learning space among students' in relation to their learning activities. In addition, this study also aims to understand which aspects of physical and social dimensions are important to support students' learning activities.

## LITERATURE REVIEW

### Physical Dimension

Literature shows that well-designed campuses tend to attract students [10] while those that are poorly designed could deter students from coming to the university [11]. There are numerous aspects of the physical learning environment that found to have influence on active, collaborative and project based learning. According to McDaniel [12], flexibility is an important characteristic of spaces as it allow students to adapt their physical environments to accommodate their preferences. This is closely related to the layout, which refers to how the physical environment facilitates students to move through and between study areas and to work within an area, either individually or with others [13]. Somerville & Collins [14] indicated that students prefer open and unconfined learning environments. In addition, they tend to spend more time in these spaces when they are able to modify the layout to accommodate their preferences.

Another commonly cited characteristic of a physical space is its architecture, which refers to the tangible inside and outside the space such as bricks and mortar, design, furnishings, lighting, ventilation as well as other resources and facilities [15-17]. In their study, Beckers, van der Voordt & Dewulf [13] termed all these as comfort and aesthetics attributes of the learning environment, adding on the aspects such as air quality, temperature, furniture and colour. Somerville & Collins (2008) endorsed the importance of comfortable and reconfigurable furniture in a particular learning space.

Similarly, Fister [18] claimed that comfortable furniture and warm colours are the most important features of learning space. Yang, Becerik-Gerber & Mino [17] showed that students' perception of attributes particularly air quality and temperature are highly influenced by the design of classrooms. In Harrop & Turpin's [16] study, students were less concerned about temperature but placed higher importance on lighting and natural light. Hunter & Cox [19] revealed background atmosphere as the best and the worst reason

for studying in informal learning spaces. When the background environment is calm and accompanied by the right music, it provides a decent atmosphere for learning. However, if the environment is noisy, too bright or plays inappropriate music, it affects students' concentration and poses stress on their learning. Aesthetic attributes related to interior design components such as colour, type of floor coverings as well as decorative quality [20]. Research highlighted environmental factors such as decor, carpeting, lighting greatly influences students' perceptions of where it is good to study [21]. Furthermore, natural elements in learning environments also determine students' attachment to the venue such as view of outdoor spaces [16], natural murals in indoor settings [22] and plants [23].

In addition, the concept of physical learning environment also relates to equipment and tools within the learning space. Resources such as ICT facilities are crucial in students' appraisal of a learning space for instance PCs, printers, large screens, access to the internet and software [16]. Cunningham & Walton [24] reminded planners of learning spaces that providing devices is not sufficient without considering the importance of power and data.

### Social Dimension

Learning requires an environment that enables students to concentrate and digest information privately. Hence, having personal space is important in students' choice of study locations. Altman [25] defined privacy as the dynamic process to control the desired level of interaction that varies according to individual differences and circumstances over time. Learners prefer spaces that provide privacy and quiet study, which is related to the idea of retreat [16]. Furthermore, they discovered students with preference for privacy placed great importance on having their own little space with no distractions or spaces that will not be overlooked by others. Majority of students are well aware that noise and busyness would have negative impact on academic performance [26]. Nonetheless, some learners do prefer some background noise when they work. They enjoy a sense of anonymity from being in a space especially when people are working in many types of way [2]. Apart from the preferred privacy, learning spaces should encourage interpersonal communication from both learning and social perspectives [16]. Students regularly worked alongside each other and this makes certain spaces more preferred compared to others. This created a 'domesticated' atmosphere for study as the space also enhances social interaction among friends such as creating a sense of community, relaxation and co-support [2,16]. In short, preference for privacy, communication and interaction goes hand in hand depending on level of interaction and nature of learning.

Appel-Meulenbroek, Groenen & Janssen [27] mentioned personal control as another construct of the social dimension, which is often used synonymously with learner autonomy, self-directed learning and learning-to-learn [28-30]. Personal control refers to the degree or level of freedom and discretion in deciding what to do, where and when. A diary study into higher institution learning space use supported this aspect as one of the main reasons to study at home as they could control the background noise and temperature as well as listen to their favourite music [13]. Despite this, some students viewed home as full of distractions and prompts them to procrastinate their works [2].

## METHODOLOGY

### Procedure

This is the first of a three-phase study to understand students' experiences and needs of informal learning space in order to inform the design of informal learning spaces in the campus to support different learning patterns. Survey questionnaire was administered to 450 students to obtain their responses about informal learning spaces across campus. The data was collected over a period of three weeks in May 2019 from both undergraduate and postgraduate students of 15 faculties. The cover of the questionnaire included a brief introduction of the purpose of the study and participants are required to sign the consent form to demonstrate their willingness to participate. Prior to the survey, a pilot study was carried out on a sample of 30 students to ensure the validity and user-friendliness of the questionnaire.

### Instrument

The questionnaire was structured into five parts to capture general profile and students' choice of learning space (Part A), assessment on the social dimension of learning space (Part B), assessment on the physical conditions of learning space (Part C) as well as learning setting preference and usage for individual (Part D) and collaborative study activities (Part E). The informal learning spaces in this study are categorised into six categories: Library spaces, faculty spaces, academic complexes, hostel, food service areas/cafeteria and other spaces in the campus.

Social and physical dimensions of the learning environment were measured using the scales developed by Beckers, van der Coordt and Dewulf [13]. The social dimension consists of 7 statements to which students respond on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The three aspects of the social dimension are privacy/retreat, interaction/communication and autonomy/control with

Cronbach's alpha coefficient of .80, .66 and .87 respectively. The physical dimension contains 12 statements and students were asked to rate on a five-point Likert scale from 1 (not important) to 5 (very important). There are four dimensions namely comfort, aesthetics, ICT facilities and layout with Cronbach's alpha coefficient of .72, .85, .65 and .56 respectively. Finally, the learning space preference for individual and collaborative study activities was measured using two types of learning setting. The first setting is the open, busy spaces in university buildings, such as entrance area with talking people, atria or corridors with others passing by and catering areas (a restaurant or a grand café in the building). The second type is the quiet, closed settings such as a project room or a personal cockpit. For collaborative study activities, personal cockpit was omitted from the choice of quiet, closed settings.

## RESULT AND DISCUSSION

### Respondents' Profile

From 450 respondents (Table 1), 24.9% were male, 75.1% were female, 60.9% were Malay, 29.3% Chinese, 5.1% were Indian and 4.7% were other races. Majority of the respondents was undergraduate students (83.3%) and 45.6% stated they frequently use hostel for academic studies followed by faculty building (24.2%) and library (15.8%). Similar outcome was found by Munir, Tharim, Mohd and Said [9] where hostel is the most favourite informal learning space on campus followed by campus cafeteria. Although hostel was not included in the choices, study by Ibrahim and Fadzil [7] shown a slightly different scenario where students preferred and frequently used cafeteria as the spot for learning activities followed by the university library.

Comfortability has been cited by students as the main reason for selecting hostel (55%), faculty building (24.8%) and library (21.1%) as the most frequently used space at UPM. For hostel, other advantages include private space (5.9%) and quiet environment (5.4%) offered by the venue. Other reasons for choosing faculty building were strong WI-FI connectivity (11%), easy to conduct discussions (10.1%), well-equipped with facilities (e.g. desktop, projector, printing service) (10.1%) and availability of resources (e.g. lecturers, books) (9.2%). For library, some students enjoyed the quiet environment (15.5%) and availability of resources (15.5%) it offers. However, some avoid studying at hostel and library as they get distracted easily in these venues (46.3%) while noisiness (22.9%) was cited as the main disadvantage of studying at the faculty building. Other disadvantages of studying at hostel include discomfort being in non-air-conditioned rooms (13.7%) and lack of facilities such as plug, books, printing facility and parking space (9.8%). For faculty building,

18.3% of the students made no comments about the space with 15.6% cited easily distracted as the negative of studying in the venue. Surprisingly, 16.9% of the students felt that library is rather noisy for them to concentrate on their studies. Further drawbacks of the venue indicated by students include its far distance from hostel (12.7%) and lack of facilities (12.7%).

**Table 1**  
**Respondents' Profile**

Variables		n	%
Gender	Male	112	24.9
	Female	338	75.1
Race	Malay	274	60.9
	Chinese	132	29.3
	Indian	23	5.1
	Others	21	4.7
Type of Study	Undergraduate	375	83.3
	Postgraduate	75	16.7
Most frequently used space at UPM for academic studies	Library	75	15.8
	Faculty Building	109	24.2
	Classroom Building (e.g. Academic Complex)	40	8.9
	Hostel	205	45.6
	Food Service Area/Cafeteria/Cafe	4	.9
	Others	21	4.7

Based on Table 2, 3 and 4, those who have chosen hostel as the most frequently used space in UPM for academic studies (Table 2), majority (94.6%) visited the venue on a daily basis with 58.1% used it for daily studies for over 4 hours (66.8%). Students who preferred faculty building at UPM showed that 83.5% came to the venue everyday with 62.4% actually used it for daily academic studies for over 4 hours (52.3%). As for library, most respondents (56.3%) visited the library at least twice a week and almost all who visited the space used it for study. However, the time spent at the library was slightly less where majority (31%) spent approximately 2-3 hours there.

**Table 2**  
**Regularity of Visit to the Space Chosen**

Type of Space	A Couple of Times a Month	A Couple of Times a Month	At Least Twice a Week	Monthly	Once a Week
	n (%)	n (%)	n (%)	n (%)	n (%)
Library	12 (16.9)	7 (9.9)	40 (56.3)	7 (9.9)	5 (7.0)
Faculty Building	91 (83.5)	5 (4.6)	10 (9.2)	0 (0)	3 (2.8)
Classroom Building	29 (72.5)	1 (2.5)	8 (20.0)	0 (0)	2 (5.0)
Hostel	194 (94.6)	5 (2.4)	5 (2.4)	1 (.5)	0 (0)
Food Service Area/Cafeteria/Cafe	0 (0)	0 (0)	4 (100)	0 (0)	0 (0)
Others	16 (76.2)	0 (0)	5 (23.9)	0 (0)	0 (0)

**Table 3**  
**Study Frequency to the Space Chosen**

Type of Space	A Couple of Times a Month	A Couple of Times a Month	At Least Twice a Week	Monthly	Once a Week
	n (%)	n (%)	n (%)	n (%)	n (%)
Library	9 (12.7)	10 (14.1)	39 (54.9)	8 (11.3)	5 (7.0)
Faculty Building	68 (62.4)	9 (8.3)	24 (22.0)	2 (1.8)	6 (5.5)
Classroom Building	26 (65.0)	1 (2.5)	10 (25.0)	1 (2.5)	2 (5.0)
Hostel	119 (58.1)	22 (10.7)	43 (21.0)	4 (2.0)	17 (8.3)
Food Service Area/Cafeteria/Cafe	0 (0)	0 (0)	3 (75.0)	1 (25.0)	0 (0)
Others	8 (38.1)	1 (4.8)	9 (42.9)	1 (4.8)	2 (9.5)

**Table 4**  
**Time Spent at the Space Chosen**

Type of Space	< 1 Hour	1-2 Hours	2-3 Hours	3-4 Hours	> 4 Hours
	n (%)	n (%)	n (%)	n (%)	n (%)
Library	2 (2.8)	13 (18.3)	22 (31.0)	16 (22.5)	18 (25.4)
Faculty Building	7 (6.4)	15 (13.8)	18 (16.5)	12 (11.0)	57 (52.3)
Classroom Building	1 (2.5)	9 (22.5)	10 (25.0)	7 (17.5)	13 (32.5)
Hostel	8 (3.9)	27 (13.2)	25 (12.2)	8 (3.9)	137 (66.8)
Food Service Area/Cafeteria/Cafe	1 (25.0)	0 (0)	3 (75.0)	0 (0)	0 (0)
Others	1 (4.8)	1 (4.8)	0 (0)	3 (14.3)	16 (76.1)

**Learning Space Preferences**

Table 5 and 6 present the descriptive statistics of the learning space preferences. Two types of learning setting were included to understand students' preference of the space for both individual and collaborative study activities, which are open, busy and quiet, closed spaces. The values indicated that students do not prefer busy, open spaces in the university building (entrance area, corridors, catering area and café) and strongly resist busy public places for individual activities (41.8%). In particular, they preferred quiet learning spaces in university buildings and library and the most favourable learning space was the hostel (44.9%). For collaborative studies with peers, although students also preferred quiet, closed learning spaces at the university and hostel, they were receptive toward studying at open spaces such catering area (30.4%) or café (34.0%) at the university building. However, busy open areas such as corridors of the university building (30.2%) and a café in town (30.4%) were not an option for collaborative study activities.

**Table 5**  
**Learning Space Preferences for Individual Study Activities**

Statement	ANP (%)	NP (%)	N (%)	P (%)	DP (%)
Learning space in the entrance area of the university building	71 (15.8)	169 (37.6)	138 (30.7)	50 (11.1)	22 (4.9)
Learning space in the corridors of the university building	75 (16.7)	184 (40.9)	121 (26.9)	53 (11.8)	17 (3.8)
Learning space in the catering area of the university building	95 (21.1)	162 (36.0)	115 (25.6)	61 (13.6)	17 (3.8)
Learning space in the cafe in the university building	94 (20.9)	133 (29.6)	123 (27.3)	78 (17.3)	22 (4.9)
Learning space in busy public places, such as a cafe in town	188 (41.8)	134 (29.8)	67 (14.9)	42 (9.3)	19 (4.2)
Learning space in a quiet place, such as a library	4 (0.9)	14 (3.1)	68 (15.1)	189 (42.0)	175 (38.9)
Learning space in a project room in the university building	9 (2.0)	26 (5.8)	141 (31.3)	211 (46.9)	63 (14.0)
Learning space in a personal cockpit in the university building	8 (1.8)	28 (6.2)	108 (24.0)	177 (39.3)	129 (28.7)
Learning space at hostel	7 (1.6)	12 (2.7)	57 (12.7)	172 (38.2)	202 (44.9)

\*ANP=Absolutely not preferred, NP=Not preferred, N=Neutral, P=Preferred, DF=Definitely preferred

**Table 6**  
**Learning Space Preferences for Collaborative Activities**

Statement	ANP (%)	NP (%)	N (%)	P (%)	DP (%)
Learning space in the entrance area of the university building	63 (14.0)	118 (26.2)	148 (32.9)	91 (20.2)	30 (6.7)
Learning space in the corridors of the university building	55 (12.2)	136 (30.2)	127 (28.2)	106 (23.6)	26 (5.8)
Learning space in the catering area of the university building	42 (9.3)	116 (25.8)	130 (28.9)	137 (30.4)	25 (5.6)
Learning space in the cafe in the university building	36 (8.0)	92 (20.4)	130 (28.9)	153 (34.0)	39 (8.7)
Learning space in busy public places, such as a cafe in town	109 (24.2)	137 (30.4)	103 (22.9)	73 (16.2)	28 (6.2)
Learning space in a quiet place, such as a library	26 (5.8)	92 (20.4)	100 (22.2)	137 (30.4)	95 (21.1)
Learning space in a project room in the university building	6 (1.3)	22 (4.9)	68 (15.1)	241 (53.6)	113 (25.1)
Learning space at hostel	24 (5.3)	34 (7.6)	92 (20.4)	187 (41.6)	113 (25.1)

\*ANP=Absolutely not preferred, NP=Not preferred, N=Neutral, P=Preferred, DF=Definitely preferred

**Learning Environments**

Mean ratings of the sub-dimensions (Table 7) were computed by averaging the ratings of those attributes included in each sub-dimension. The most important sub-dimension was comfort (physical dimension) with a mean of 4.27, followed by autonomy/control (social dimension) with a mean of 4.25 and ICT facilities (physical dimension) with a mean of 3.93. The importance of physical dimension attributes was also reported by Ibrahim and Fadzil (2013) where the frequency of use of the informal learning settings

depends on the environmental comfort, functional and internet ICT accessibility. Similarly, Munir, Tharim, Mohd and Said (2018) discovered that facilities provided by the learning space are directly related to students' satisfaction on learning place. The least important sub-dimension was aesthetics of the physical dimension with a mean of 3.40. For comfort sub-dimension (Table 10), students placed great importance on temperature (53.3%), comfort of the furniture (45.3%) and size of the working space (43.1%) while for autonomy/control sub-dimensions (Table 11), students felt that it is important for them to be able to decide when (56.9%) and where (54.9%) they work on their study activities. In addition, the presence of desktop computers (39.1%) and printing facilities (37.8%) in the learning environment were deemed as important under the ICT facilities sub-dimensions. Aesthetics factors such as colour in the building (38.7%) and the finish of floors (34.9%) were perceived as moderately important by students while the finish and decoration of the learning environment (40.4%) and the presence of plants (36.5%) were being seen as important.

**Table 7**  
**Mean Ratings for All Sub-Dimensions**

Dimension	Sub-Dimension	Mean	SD	$\alpha$
Physical	Comfort	4.27	1.77	.72
	Aesthetics	3.40	2.00	.85
	ICT facilities	3.93	1.20	.65
	Layout	3.68	2.27	.56
Social	Privacy/retreat	3.53	3.51	.80
	Interaction/communication	3.61	1.73	.66
	Autonomy/control	4.25	1.72	.87

**Table 8**  
**Physical Dimension of the Learning Environment**

Statement	NI (%)	SI (%)	MI (%)	I (%)	VI (%)
The presence of natural light	6 (1.3)	15 (3.3)	76 (16.9)	192 (42.7)	161 (35.8)
The temperature of the environment	0 (0.0)	1 (0.2)	30 (6.7)	179 (39.8)	240 (53.3)
The comfort of the furniture	0 (0.0)	11 (2.4)	58 (12.9)	177 (39.3)	204 (45.3)
The size of the working space	1 (0.2)	9 (2.0)	54 (12.0)	192 (42.7)	194 (43.1)
The use of colour in the building	26 (5.8)	58 (12.9)	174 (38.7)	112 (24.9)	80 (17.8)
The finish of the floors in the buildings	30 (6.7)	68 (15.1)	157 (34.9)	134 (29.8)	61 (13.6)
The finish in general and the decoration of the learning environment	13 (2.9)	55 (12.2)	142 (31.6)	182 (40.4)	58 (12.9)
The presence of plants in the learning environment	28 (6.2)	54 (12.0)	129 (28.7)	160 (35.6)	79 (17.6)
The presence of desktop computers in the learning environment	8 (1.8)	38 (8.4)	93 (20.7)	176 (39.1)	135 (30.0)
The presence of printing facilities in the learning environment	14 (3.1)	22 (4.9)	82 (18.2)	170 (37.8)	162 (36.0)
A central location of learning settings in the building	8 (1.8)	31 (6.9)	113 (25.1)	186 (41.3)	112 (24.9)
The transparency or openness of the learning environment	30 (6.7)	40 (8.9)	120 (26.7)	168 (37.3)	92 (20.4)

\*NI=Not important, SI=Slightly important, MI=Moderately important, I=Important, VI=Very important



**Table 9**  
**Social Dimension of the Learning Environment**

Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)
I find it unpleasant when others can see what I do	7 (1.6)	47 (10.4)	157 (34.9)	149 (33.1)	90 (20.0)
I find it unpleasant when others can hear what I say	12 (2.7)	50 (11.1)	172 (38.2)	148 (32.9)	68 (15.1)
I enjoy being with others	5 (1.1)	28 (6.2)	132 (29.3)	216 (48.0)	69 (15.3)
I enjoy working with others	3 (0.7)	16 (3.6)	127 (28.2)	226 (50.2)	78 (17.3)
I go to campus/lecture for company too	24 (5.3)	46 (10.2)	175 (38.9)	167 (37.1)	38 (8.4)
I think it is important to decide for myself when I work on my study activities	0 (0.0)	5 (1.1)	39 (8.7)	256 (56.9)	180 (33.3)
I think it is important to decide for myself where I work on my study activities	0 (0.0)	4 (0.9)	34 (7.6)	247 (54.9)	165 (36.7)

\*SD=Strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly agree

## Conclusion and Implications

The current study investigated the choice and usage of informal learning space among students' in relation to their learning activities. This study also aimed to understand which aspects of physical and social dimensions are important to support students' learning activities. According to this study, the most preferable learning space among respondents is hostel due to the desired levels of comfort, privacy and peace offered by the venue. Furthermore, hostel is an ideal study space for students who work best in quiet, closed conditions, both individually and collaboratively. For collaborative studies with peers, students are receptive to busy, opened environment such as catering areas and café'-like spaces with group seating arrangement. The main drawbacks of hostel as a learning space were the non-air-conditioned rooms and insufficient facilities such as plug, books, printing facility and parking space.

In terms of learning space attributes, comfortability is the dominant aspect in students' assessment of the physical dimension. A comfortable learning space has been associated with good thermal comfort, comfortable furniture, adequate size and the presence of natural light. Autonomy or control of the social dimension appeared as the second most important attributes where learners desire a sense of being in control of their learning choices. It represents the way students are able to exercise ownership and control over the learning process and the spaces they use. The next aspect that students concern greatly is the availability of ICT facilities such as desktop computers and printers at the space. Good ICT facilities enable fast, borderless knowledge transfer and access that could create flexible informal learning spaces.

The outcome of survey provides guidelines for setting up and designing focus group studies. The second phase of the study comprises a small group of carefully selected students who are recruited based on their experience of using the informal spaces across campus and have potential to provide rich information to the study. Based on the themes that emerged from student-driven data, a practical guide for redeveloping or redesigning informal learning spaces in the campus will be outlined. Following this, a design layout that corresponds to the elements highlighted in the proposed guidelines will be produced as part of the study's outcomes.

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