The Outdoor Learning Spaces Design Framework: A Case Study for Integrating Outdoor Spaces for Learning in Bulacan State University

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Abstract

COVID-19 caused a massive shift on face-to-face education and the usual classroom setting into online and flexible learning platforms. In 2022, the Bulacan State University – Main Campus had shifted back to the face-to-face classroom setting but with the spatial and policy restrictions brought about because of the pandemic. Outdoor learning spaces (OLS) convert the open spaces within the campus into flexible spaces that can be used for lecture and laboratory classes. These potentially provide more areas for face-to-face classes, and it circumvents restrictions set upon indoor classroom settings. There are many factors that range from environmental, comfortability, flexibility of usage, and learning effectiveness that need to be considered when selecting and designing OLS. The research studies various literature that are involved with integrating OLS. The faculty and administrators across the whole campus were consulted on their ideas with outdoor spaces to be used as classrooms. Tools, the Site Assessment Criteria Table and Design Implementation Strategy Table, will be formulated from the gathered data to facilitate and aid the site selection and design of OLS. Case studies were conducted to test the usability of the tool on various locations with different situations in the campus. Sites were assessed and designed according to the results from the usage of the tools which are considerate to the potential users and state of the area. Using the tools created by the study, it is possible for campus administrators, architects, and landscape architects to properly integrate OLS in a variety of situations.

Keywords: Outdoor learning spaces, face-to-face education, COVID-19 adaptation, landscape architecture for pedagogy

1   Introduction

The COVID-19 pandemic has caused many disruptions in people's way of life. Public transportation limitations and workplace population restrictions have led to various work-from-home schemes. The lack of comfortable, well-planned outdoor spaces was revealed by the pandemic because the physical distancing requirement (people being 1.5m apart) cannot accommodate all visitors or customers with the current spacing of

indoor spaces such as supermarkets, banks, schools, offices, and malls. This has led to building administrators to set up waiting lines snaking around their buildings or positioned waiting areas around shaded areas in their property.

Originally, well-planned open spaces promote the improvement of public health and environmental health by providing opportunities for healthier environments, reducing the exposure of the community to chemicals, pollution, and adverse climatic conditions. Moreover, active open spaces also provide ways for users to do exercises and physical activities to improve the health of community members. Outdoor spaces have been known to be safer spaces to move and interact during this time of pandemic. The ventilation and space that can be accommodated by outdoor spaces reduce the possibility of COVID19 transmission.

The standard education system includes the use of airconditioned rooms and packed corridors during the whole duration of a school day. The pandemic has essentially rendered the current face-to-face system unusable because the current infrastructure of schools cannot accommodate all students while maintaining social distancing. Limited usage of interior spaces has led to the adoption of online and remote printed learning for all learning age groups, early childhood to higher education. The current measures for re-opening classes are not entirely accessible to all income classes because of lack of devices and bad internet connection. Moreover, remote printed learning and independent styles of learning are not ideal for young learners. All said modes require additional input from parents leading to additional stress and effort in the household.

There are many studies that show the opportunities for using outdoor spaces for learning activities. Other countries have started to convert the outdoor spaces of their schools to accommodate learning spaces to facilitate and provide the space needed for the upcoming school openings. If current synchronous online learning and remote printed learning methods prove to be difficult to implement and detrimental to student learning, use of school grounds might be an inevitable occurrence. The current outdoor environment of Bulacan State University is a potential resource that can be developed into outdoor learning spaces to provide opportunities for safe face-to-face learning environments. A design methodology in the local setting for properly implementing such spaces for the university and, possibly, for other educational institutions is crucial in facilitating costs and good design. However, there are multiple concerns associated with the development of outdoor spaces. Vulnerability of students, teachers,

and teaching materials to weather and climate, as well as safety and security are the most pertinent issues dealt with outdoor learning spaces. Learners, particularly the young, are also prone to distractions during learning sessions. Planning methodologies are yet to be developed to address these concerns and allow educational institutions to integrate outdoor learning environments more easily in their areas.

The case of Bulacan State University, a state university in the province of Bulacan, in the city of Malolos states the benefits of flexible learning modalities are the convenience and potential enhancement of teaching and learning. In this study conducted by Borja, Azarcon, and Santos (2021), teachers are using technology to improve facilitation of teaching and reach students more and provide a more convenient mode of learning. However, as the university engaged in flexible learning, the crucial concerns are the reduction of comprehension of learning content, student engagement, and potential disconnection of internet connectivity. The open challenges emerged from the COVID-19 health emergency. The findings were categorized into three:

1) Technological challenges, the access to infrastructure such as technological devices and an internet connection;

2) Pedagogical challenges, which is about three aspects as:

    a. The teachers' lack of skills in using technology
    b. The need for training and guidelines for teachers and students
    c. Need for teaching materials in the form of interactive multimedia(images, animations, educational games) to engage and maintain students' motivation, and lack of student feedback and evaluation system; and

3) Social challenges, or the lack of suitable home learning environment to study and parents' support.

In summary, the difficulties encountered by the university students and their teachers during flexible learning in the time of the pandemic can be classified into ten categories: Unstable internet connectivity, inadequate learning resources, electric power interruption, vague learning contents, overloaded lesson activities, limited teacher scaffolds, poor peer communications, conflict with home responsibilities, poor learning environment, financial related problems.

Bulacan State University (BulSU) is a state-university, with about thirty-six thousand students and more than a thousand teaching and non-teaching staff across multiple colleges and senior high school. It is in the urban center of the Malolos City along the main road, McArthur Highway, and beside the Bulacan Provincial Capitol and nearby the Malolos City Hall. It is adjacent to multiple commercial centers and concentrations of residential areas.

Standard infrastructure of classrooms in the university includes closed airconditioned and open-air classrooms. These can hold up to fifty students during one class session with no social distancing. Open spaces within the university are used by general university population. Activities of students include studying, hanging out, practicing school activities, eating, etc. Walkways and corridors around the university can accommodate two-way foot traffic under normal circumstances. However, movement flow with social distancing will be crowded-out and would cause clog-up foot traffic. Pedestrians also have the roads to walk and keep socially distant but, issues with pedestrian-to-vehicular safety will be the next concern. These concerns create possible opportunities for improved parking planning and pedestrian interaction. A new campus expansion is currently being planned in a nearby location from the original university. The integration of outdoor learning spaces can be included in the planning of open spaces of the new campus utilizing them into both usable outdoor spaces and outdoor classroom settings.

The need for improvements in the university is exacerbated by the effects of the new normal to the educational system both for students and teachers have been drastic. It has become a great advantage for students and a requirement to teachers to have access to the internet and reliable hardware and software, leading to the additional expenses incurred by the student population. With some of the student and teacher population lacking consistent means to the internet, this has highlighted preference to face-to-face learning and challenges of online learning. The Philippine national government is eyeing for the resumption of face-to-face classes in 2021, but there is still backlash from several groups because of the threat of COVID-19 transmission especially with the normal setup of public schools fitting around forty or more students into a single classroom. With the incoming first semester of academic year 2022-2023, the BulSU administration have produced guidelines on the Hybrid Flexible (HyFlex) learning modality. This new set of learning modalities give opportunities for classes to be held face-to-face inside the campus while maintaining a certain degree of online synchronous and asynchronous schedules. This

shift to the usage of the campus for face-to-face classes would need to comply with COVID-19 pre-cautions such as physical distancing, and reduced users per indoor room. This might lead to a shortage of rooms that can be used that might limit the number of classes that can continue with the face-to-face learning modality.

The transition from the new normal learning methodologies during the COVID-19 quarantine period to "newer normal", post-COVID-19 learning environments will have challenges because the current learning infrastructure is more focused on indoor classes. It raises the following questions to achieve a pandemic resilient, and multi-use campus open spaces that will create opportunities for outdoor learning experiences are integrated in universities to rationalize post-quarantine face-to-face learning.

1. How can open spaces improve resilience to COVID-19 and future pandemic situations?
2. What are the measures needed for COVID-19 prevention in outdoor learning spaces?
3. What strategies and standards are needed to achieve the proper space allocation, needed details, and implementation of outdoor learning spaces?
4. What are the implications of the outdoor learning space setup on the curriculum, lesson delivery, or lessons-taught?
5. What locations within Bulacan State University can be used for implementation of outdoor learning spaces?
6. What activities in the designated outdoor learning spaces of the university were previously being done and will continue to be done in these locations?
7. How can outdoor learning space integration be rationalized for both existing and future campus plans?

2   Review of related literature

The review of related literature for this paper is focused on research related to the pros and cons of outdoor learning and flexible learning, the observations, and insights to the implementation of outdoor learning, and strategies enacted by other institutions or countries for opening post-COVID19 face-to-face classes. These literature reviews will also be used in the formulation of indicators for the tools that will be created in this research.

According to Maheran, et. al., in their 2017 study, the benefits of an outdoor classroom, how it affects the students' learning performances, and how to achieve a better learning outcome. It points out that an outdoor classroom can cultivate joy in learning, reduce the use of electronic media, and provide progressive outcomes in the physical, psychological, and emotional aspects. To help analyze the key features needed in designing outdoor learning spaces, the characteristics of an outdoor classroom like flexibility, comfort, noise zone, pervasive technology, and accessibility should be considered. Additionally, these should be diverse, versatile, technologically reliable, well-maintained, and effective. It should be an outdoor space that inspire students and promote their creativity. Maintenance of the area should also be prioritized for longer usage.

Table 1. Key features of design spaces (Maheran, et. al., 2017).

Key features of design spaces for active learning
1. Sense of belonging

• The space that accommodates divers students and public
    • Maximize the use of daylighting to reduce energy use
    • Multipurpose spaces for varying learning activities
    • Comfortable spaces build a feeling of connection towards the environment

2. Flexibility and multi-use spaces

• Movable furniture to incorporate multifunction activities
    • Highly flexible, self-contained and free distraction spaces
    • Increasing flexibility of spaces for specific functions and multi-function activities
    • Design features to maximize user control

3. The uses of non-classroom spaces for learning

• Design spaces to overcome functions and services
    • Space availability merges social interaction
    • Usable transaction spaces between indoor and outdoor

Table 2. Characteristics of the Outdoor Classroom (Maheran, et. al., 2017).

Characteristics of the Outdoor Classroom	
1. Flexibility	5. Pervasive technology
2. Comfort	6. Access learning media
3. Ergonomic seating	7. Accessibility
4. "Noise zone"	
Individual Study	**Group work discussion**
- Free from distraction and noise	- Soft furniture for discussion
- Comfortable	- Controllable facilities
- Please aesthetic	- Spaces integrate needs and desires
- Variety furniture	
- Good lighting	
1. Comfort spaces	4. Equity – the space supports PWD movement
2. Aesthetical values – simplicity and harmony	

3. Physical and psychological flow of movement	5. Blending of technology tools and facilities 6. Repurposing – accommodate different activities as possible
1. Environmentally protected spaces 2. Flexibility 3. Furniture for learning	4. ICT tools and facilities 5. Various design elements beyond functional needs
1. Spatial environment – space for physical and learning needs 2. Scale and aesthetics – accessibility and attractiveness of space	3. Ambient factors – comfortable designed spaces 4. Architectural element – flow and layout of spaces 5. Visual element – availability and adaptability of lighting in the outdoor setting
1. Ease of movement – connectivity, legibility, comfort and safety 2. Sense of identity – local style, native plants	3. Accessibility – distance between spaces, continuity, ease of finding spaces 4. Quality of the public realm – cleanliness, overall appearance, quietness
1. Creative and innovative space 2. Multipurpose outdoor area 3. Integration between outdoor and indoor	4. Designed space to provide activities 5. Outdoor spaces as focal point 6. Shaded spaces 7. Technology accessibility
1. Legibility 2. Social relation	3. Space quality 4. Accessibility 5. Comfort
1. Thermal comfort – reduced temperature of the surroundings 2. Aesthetic value 3. Natural elements – students interact with nature	4. Identity of the space 5. Educational related concept – stimulate students' learning – interest 6. Safety and security 7. Cleanliness
1. Accessibility 2. Safety 3. Comfort 4. Comfortable furniture 5. Calm for private and meeting space	6. Eliminating non-emergency preventives 7. Multi-functional spaces 8. Sense of space

Table 3. The Design Principles for Learning spaces (Maheran, et. al., 2017).

The Design Principles for Learning Spaces	
1. Outdoor spaces for multiuse concurrently 2. Flexibility designed within each space 3. Design settings that have varied facilities	4. Design features and functions to maximize teacher and student control 5. Arrangement spaces to support student's curricula 6. Learning space design that provides accessibility for students
1. Support multiple types of learning activities 2. Enable connection with surrounding 3. Accommodate information technology	4. Design spaces for comfort, safety, and functionality 5. Reflect institutional values
1. Diversity spaces for learning activities 2. Versatile 3. Technologically reliable settings 4. Well-maintained facilities	5. The spaces should be universal in space and time 6. Effectivity learning space for students' multi-activities 7. Sufficient resources allocated for learning spaces
1. Flexible – outdoor spaces that accommodate current and evolving pedagogies 2. Future proofed – settings that the enable space to reconfigure and adapt external changes	3. The space that technology facilitated 4. Outdoor settings that inspire and promote creativity to users 5. Enterprising – outdoor settings that support different processes.

In a 2020 study by Slater, et. al., green spaces and recreational areas are proven to have a soothing and restful impact to people's mental and physical health. However, the availability of these places has been limited or worse, paused for usage after COVID-19 went widespread. These factors have resulted to adverse physical and mental impact to people due to the big and unfamiliar shift. As people are still adjusting for this sudden change of lifestyle, the struggle of adapting while being limited to green spaces and public recreational areas might exacerbate the situation. In relation to the study being conducted, the closure of schools paved way for utilizing online and remote printed modalities which might result to undesirable impacts on the holistic health and learning of the students—especially the younger ones—as they require extra effort for both the parent and the child, as well as the academe. The said modalities also limit the learnings of students by restricting interactions between the instructors, students, and the outside world, resulting to additional stress. Therefore, access to open spaces will help in improving mental health, increasing the immune system, and lessening the development of chronic sickness of people, which means lesser health impact of the virus.

The world has faced the greatest challenge of the present time global health crisis, or the COVID-19 pandemic outbreak leads to a dramatic impact on the global community on economies, health and lives of the people, and their behaviors. COVID-19 impact studies like one written by Honey-Rosés, et. al. in 2020 describe the restrictions on the use of public spaces and social distancing that have been strictly implemented to protect people's health and reduce the transmission of the virus. Professionals and public observers weighing in on many emerging preliminary research questions that are significant to study and conclude if the current global crisis will change the people's relationship to public spaces.

The questions provide insights on how the outbreak may change public space design, management, perceptions, and its uses. This gives the researchers an unprecedented opportunity to examine the links between public space, urban planning, and wellbeing. Also, certain studies will require a re-evaluation of how public spaces and their design can save and increase the significance of planetary health.

In the Philippines and some other countries, schools are helping the students through remote learning because of the pandemic, that students were not able to take classes traditionally. Remote learning is the most preferred option students chose for distance learning, online classes, and printed modules for the current and next school year. Research has proved

the outdoor spaces to be safer to move and interact throughout this time of the pandemic. Outdoor spaces can ensure proper ventilation and space that reduces the possible transmission of the COVID-19 virus.

There are many important considerations in the development and usage of outdoor spaces like the vulnerability of the students, teachers, and their teaching materials to climate and weather conditions. The learners, most especially the young students, are prone to distractions during classes. The most important is the safety and security of every people while using outdoor learning spaces. If the experiences of the students, teachers, and parents of the learners with the remote learning during these past months proves to be difficult to implement, the outdoor learning spaces will have an opportunity for safe face-to-face learning classes. This can only be possible with an active community and practices. It is relevant to study the design criteria, development planning, and the public health professionals must merge to build healthier outdoor spaces for face-to-face learning sessions during this crisis and the future state of the environment.

Theoretical framework
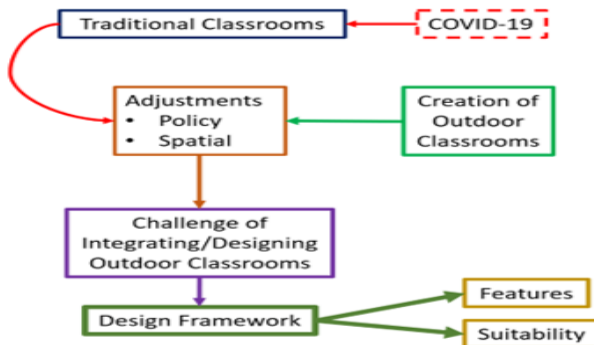

Fig. 1. Theoritical Framework

3   Methodology

The study is focused on improving the implementation of outdoor learning spaces to aid with the incoming face-to-face classes in the new normal. It will be done through qualitative research that will delve into the topics of the pros and cons of outdoor learning and flexible learning, the observations, and insights to the implementation of outdoor learning, and strategies enacted by other institutions or countries for opening post-COVID19 face-to-face classes. Moreover, according to the publication of Public Health England titled, Spatial Planning for Health: An evidence resource for planning and designing healthier places, a systematic approach to evidence gathering through a qualitative approach is best when dealing with built and natural environments that are meant to improve on health outcomes. It is more practical to investigate considerations and factors through a qualitative approach to better determine the needs and formulate proper solutions to public health issues.

Through the help of the information gathered by the Bulacan State University and summarized by Borja, Azarcon, and Santos from the disseminated surveys regarding the mindset of teachers and students about online and remote printed learning (RPL), which resulted in highlighting the strengths and weaknesses of the various flexible learning modalities (FLM) for the formulation of future guidelines regarding FLMs. There was an emphasis on the bad experiences, challenges, and disadvantages of the RPL modality. Using the survey, the researchers will have data about the preferences of the university community with regards to learning strategies during a crisis like COVID-19. The interviews with the faculty about the potential subjects and activities are determined on which can be done outdoors. An interview with campus architect and Project Management Office on the possible areas that can be converted into outdoor learning spaces was also done and it included coordination with architectural standards of school classrooms and other infrastructure requirements that might be involved.

Here are the questions in the interview questionnaire distributed in the university. The first set of questions were given to the Project Management Office. The second set of questions were distributed to the different faculty members of the various colleges in the main campus of the university.

Questions:

1) Do you have any recommended areas that can be converted into outdoor learning spaces? Which areas within the main campus do you think are suitable to be used in such a way? Which areas can be improved to accommodate this usage?

2) Does the university or CHED have specific infrastructure requirements and standards (ventilation, minimum area for workspaces, minimum number of seats, required amenities like sinks, etc.) for learning spaces such as classrooms, workshops, and laboratories? Which ones are we observing currently in the rooms and laboratories that we have?

Fig. 2. Questions for the Project Management Office.

Questions:

1) Do the students in your class mainly come from within your college or do they come from various colleges and locations?
2) What kinds of classes or class activities will benefit from being able to use outdoor areas as learning spaces?
3) What are the learning materials or equipment needed by your classes?
4) What advantages or disadvantages do you see when conducting activities or classes in outdoor learning spaces?

Fig. 3. Questions for teachers around the university

According to the reviewed literature, the success of outdoor learning spaces lies in its proper implementation. Successful implementation strategies are justified with a variety of criteria that are held in differing levels of importance. Tools that will aid in the proper study of sites and planning of outdoor learning spaces will be created. These criteria will be formulated from a synthesized review of related literature for site assessment as a guide for studying the needs of the site and design strategy formulation that will be used as a guide in designing the outdoor learning space. Their indicators will be adapted from international sources to suit more local conditions. Both tools will be qualitative and focus on the opinions and insights of the selected respondents. The formulation of tools will enable and guide decision-makers and stakeholders with or without a design background.

To test the created tables for the tool, a site visit around the campus to view the different outdoor spaces around the Bulacan State University Campus. Then, test areas were selected to discover the opportunities of the sites inside the campus. The sites will be selected based on the current activities that are being conducted there and potential activities once they

are developed. Variety of target users and accessibility of the area will also be considered in the selection of the site. Prioritization on which is the best area is not the focus of the testing of the tool.

4 Results

The approach in formulating the outdoor learning space design framework tool is by gathering criteria for the indicators from various literature that cover topics on health standards, and outdoor teaching. Studying about these topics was already started in the review of related literature and this chapter deals with the finalization and synthesis of the indicators.

Considering the local regulations for the spatial requirements to prevent the spread of COVID-19, the Department of Health (DOH) Minimum Public Health Standards for COVID-19 related resilience which includes the following will be used as one of the references for the indicators:

1. Increasing physical and mental resilience
2. Reduce transmission
3. Reduce contact
4. Reduce duration of infection
5. Minimal physical distance in higher education institutions – 1.5m

This implies that the occupancy capacity is reduced because there is a need for strict observance to the 1.5m physical distancing. Therefore, re-arrangement or re-configuration of classrooms or other open areas can be done. The classrooms and laboratories require proper ventilation to reduce concentrations of airborne contaminants. The ingress and egress points that are compliant with standards of minimum physical distances can be adjusted to do one-way traffic for human traffic, limit human intersections and interaction during movement, and opportunities of cleaning the rooms and equipment used by students and instructors.

Research by Slater, Christiana, and Gustat in 2020 emphasizes the importance of green spaces in maintaining good physical and mental health. However, COVID-19 has made these spaces inaccessible and unusable leading to less availability. The physical distance restrictions, small areas that cannot accommodate more users, and harder to access for areas have highlighted the reduced usability of current green spaces. The lack of stimulation of people in green spaces have led to adverse physical and

mental health impact. Moreover, the COVID-19 pandemic has caused schools to adopt a modality that forces students to stay at home and study where there is a reduced learning experience because of lesser interactions of instructors, students, and the outside world. The research's recommendations for improved open space accessibility will allow users into areas for exercise and active living that will improve immune system, lessen development of chronic sickness, and reduce health impact of pandemics.

A study by Fagerstam (2012) deals with the perception and experience of teachers and students regarding outdoor teaching and learning. It studied the consequences of a school-based outdoor learning and teaching in the junior high school context. The advantage of outdoor teaching and learning include encouragment of a meaningful learning experience by moving between the abstract and concrete, and transforming experience into knowledge through reflection and communication. The philisopher, John Dewey, posed questions on the concept of taking indoor classes as the only source of knowledge. This perspective of continuous interplay between experience and interaction and reflection has significantly influenced outdoor education literature. The outdoor environments enable students to build connections across different areas of experience and provide points of engagement for learner. It is perceived as a way to improve students' place attachment as well as knowledge and understanding of the local environment. Although common outlook on outdoor teaching is still seen as time-demanding and less efficient because no difference in academic perfermance was observed between indoors and partial outdoor students, in a test conducted in the study, outdoor groups performed slightly better and had better recall of the course activties. This suggests a perceivable advantage of outdoor learning for academic performance.

The concerns of outdoor learning such as, vulnerability of students, teachers, and teaching materials to weather conditions, safety and security of materials and users, especially if the area is open to public, and distractions to students are important indicators of what needs to be addressed in the successful implementation of outdoor learning spaces.

A position paper in 2020 written by educators from the states of Maine, New Hampshire, and Vemont in the United States indicated that the spread of COVID-19 has caused many disruptions to human mental health, activity, work, and education. Humans being normally social people have been forced to their homes and are prevented to be able to intermingle with others especially with family and loved ones. The pandemic has brought to light a new focus for nature-based learning. This will allow for provisions

for equitable access to safe, nurturing environments, learning opportunities for the children to have access to outdoor spaces such as indigenous cultural sites, and flexible pathways to educational participation through defined routes of communication. The time spent learning with nature provides great academic, social, emotional, and physical benefits. The study indicates that schools should consider outdoor learning in response to the re-opening of classes. Outdoor spaces are potential learning grounds during the time of the pandemic. Current online learning conditions have been difficult to implement for some students. Creating outdoor learning spaces can increase the possibility of re-opening of schools and increasing capacity of schools.

In the journal article of Honey-Roses (2020), they compiled questions on how COVID-19 will change the design, use, behaviour, and perceptions of public spaces. These questions can be used as a basis for indicators for designing outdoor spaces that are ready for a potential pandemic situation.

Table 4. Summary of emerging questions about how the COVID-19 episode may change the design, use, behaviors, and perceptions in public space. Honey-Roses, et. Al. (2020).

Use, Behavior, Perceptions
1. Will we oberseve fewer people in public?
2. Will we change what we do in public?
3. What is the future of large public gatherings?
4. Will our perceptions of public space change?
5. Will our intuitive carrying capcaity for public spaces decrease?
6. What will be the impacts on public transit?
7. What will happen to micro-mobility and mobility sharing?
8. Will we observe changes in the use and regulation of interior public spaces?
9. Will we experience infringements on civil liberties?
Design
10. Will the temporary transformations during the crisis inspire permanent change?
11. Will streets be re-designed?
12. Will the pandemic accelerate the mainstreaming of health criteria into the design of public spaces?
13. Will green space planning need new designs, uses, and practices?
14. Do we needa new typology for public space?
Inequities and Exclusions
15. How will the needs of vulnerable groups such as racial minorities, immigrants, women, the poor, elderly, children, disabled, and the homeless be accounted for in future public space designs, practices, and rules?
16. Will cities in the global south attempt to constrain further or regulate the informal street economy?
17. Will COVID-19 change who moves in and who moves out of newly redeveloped urban centers?
18. Will everyone be able to shift to active transit?
19. Will the pandemic permanently disrupt the interconnected global setllement system and freedom of movement?

To acquire insights from the actual users in the campus, questions were distributed to the faculty which allowed the research to gather insights on the potential needs and perceived advantages and disadvantages of outdoor learning spaces. The consolidation and synthesis of the insights of these answers were used as additional basis for the indicators of the created tools.

1. Do the students in your class mainly come from within your college or do they come from various colleges and locations?

Teachers who handle subjects that are taken as general education courses are more likely to have students from various colleges attending their classes. However, certain colleges have specific needs for the activities of their courses. Therefore, the outdoor learning spaces that are situated near colleges with specific activities should be designed to the potential equipment that they would need. Outdoor learning spaces that are in areas that are accessible to the general population of students will have flexibility of the space as a priority.

2. What kinds of classes or class activities will benefit from being able to use outdoor areas as learning spaces?

Practical activities are the primary answers to this question. This emphasizes the need for a proper design to accommodate the expected activities that will be done in the area. Lecture subjects were also mentioned but to a lesser extent because of the potential disadvantages for these subjects.

3. What are the learning materials or equipment needed by your classes?

Ergonomic tables and chairs, and whiteboards for lectures were mentioned as general items that would be usable by most of the respondents' subjects. More specific answers include sinks (portable or fixed) for cleaning of materials like dissection kits and art materials.

4. What advantages or disadvantages do you see when conducting activities or classes in outdoor learning spaces?

Perceived advantages for outdoor learning spaces are better ventilation, potential for improved learning due to new environments and activities, and improved mental health support for students and teachers. The main concerns and disadvantages include potential for distractions of students from their class, potential smell of materials being used for the activities

like formalin for dissection activities, weather conditions, and ambient temperature of the learning area.

The data gathered regarding the proper implementation of outdoor learning spaces was collated and synthesized into a tool that is designed to have two parts, the Site Assessment Criteria (SAC), and the Design Implementation Strategy (DIS) tables. The SAC table allows users to do a guided observation of the area being studied for development as an outdoor learning space. This will allow the decision-makers and stakeholders to create informed decisions and assessments on the development of these areas. The expected users of the SAC table aside from the decision-makers and stakeholders can be users such as teachers and students. This will allow them to align their expectations on the usage of the area to their assessments. When using the SAC table, it is expected that the users have done prior site visits and are aware of the current situation of the area being studied.

Outdoor Learning Spaces - Site Assessment Criteria			
Indicators	Description	Observation	Assessment
Functional Considerations			
Flexibility of Area	Potential for flexibility of usage (lecture room or laboratory; course variety; non-educational uses; individual or group usage)		
Size & Capacity	Up to how many students and instructors can be accommodated, given that the 1-m apart restriction is still enforced		
Equipment Available	Teaching materials available in the area; ease of installation and potential of addition of teaching equipment in the area		
Access & Accessibility	Entry points going into the area; provisions or difficulties for PWD users		
Ventilation of the area	Functional ventilation of the area whether it is indoor or outdoor		
Population usage	Variety of potential users such as access to various academic programs and colleges		
Aesthetic & Environmental Considerations			
Materials Used	Existing usable materials (hardscape & softscape) that can be used		
Distractions Present	Current and potential distractions present in the area that might hinder the learning of students		
Thermal Comfort	Comfortability of the area if used on a regular basis		
Environmental value	Presence of trees and types of the trees; usage of renewable energy or resource recycling		
Safety & Security	Potential threats to the area; lighting of the area		

Figure 4. Sample SAC table.

Each indicator of assessment is geared towards determining the current usability and reception of the area by teachers, students, and other potential users and produce assessments of improvements for them. They are split into two main considerations: Functional, and Aesthetic & Environmental. Functional considerations that are focused on the usability and potential activities of the area include the following indicators and their guide questions:

1. Flexibility of Area – is the area to accommodate a variety of activities from lecture classes to laboratory and practice activity classes? What activities or classes can be conducted in the area?

2. Size and Capacity – how many persons can the area accommodate given that the 1m distance restriction is in effect? Will they be able to properly do certain practice activities?

3. Equipment available – what equipment is available in the area? Would it be possible to bring in lecture equipment or practical activity materials in-and-out of the area easily?

4. Access and accessibility – how accessible is the area? Is it PWD friendly? Are there multiple points of entry to reduce bottlenecks in circulation?

5. Ventilation of the area – is the area well-ventilated and with proper air circulation? Is it conducive for tropical conditions?

6. Population usage – how many different colleges and programs can access the area? Is there a wide variety of potential users?

Meanwhile, Aesthetic & Environmental Considerations that focus on area's relation with adjacent areas and preference of users to utilize the area include the following indicators and their guide questions:

1. Materials Used – are the existing materials reusable? What materials are needed for the improvement of the area?

2. Distractions Present – what are the current and other potential distractions that would affect the students and teachers?

3. Thermal comfort – is the area comfortable to be used during sunny and raining conditions?

4. Environmental value – is the area harnessing any form of sustainable energy? Are there trees present in the area?

5. Safety and security – are there any potential safety and security threats? Is there ample lighting of the area? How can the safety and security of the area be improved?

After the study areas are assessed and using the gathered information, the potential design strategy to be implemented is determined using the DIS table. The strategies can be individually planned out or be part of a more holistic masterplan. The groupings of indicators are similar to the SAC table, however they are labelled differently in the DIS table. The Functional Considerations grouping is translated into the Individual Factors Considerations because indicators listed here the primary individual factors that need to be considered in the design. Meanwhile, the Aesthetic and Environmental Considerations grouping is translated into the Holistic Integration grouping wherein factors under this group are designed geared to support the Individual Factor group. The one answering the tool will input an intended strategy for each indicator, state how and why it will be effective, and its ideal method of implementation. The respondents for this table will be the ones in-charge of the improvements of these areas. This can be a group of individuals with varying perspectives or a single office with a direct hand in the determination of strategies to be done. Completion of the tool will allow the decision-makers to plan for the implementation of the strategies in terms of budgeting and time management. If there are multiple persons/parties involved with the creation of strategies, they can coordinate and consolidate their findings from using the tool and come up with a cohesive and coordinated solution.

Outdoor Learning Spaces - Design Implementation Strategy			
Indicators	Intended Strategy	Potential effectivity	Method of implementation
Individual Factor considerations			
Flexibility of Area			
Size & Capacity			
Equipment Available			
Access & Accessibility			
Ventilation of the area			
Population usage			
Holistic integration			
Materials Used			
Distractions Present			
Thermal Comfort			
Environmental value			
Safety & Security			

Figure 5. Sample DIS table.

5 Discussion

The Project Management Office (PMO) of the university provided a list of potential areas that can be studied for this paper. This list provided insights on the PMO's vision of outdoor learning spaces. Since the study emphasizes that any location in the university can be utilized as an outdoor learning space, the chosen sites for the examples in this study include areas with different use situations in the campus.

The College of Hospitality and Tourism Management (CHTM) area is an area more focused on its own college because the location of its open space is in a lesser accessible area. It is also selected because the college had a program in place for the improvement of their area. The area is accessible and shared with the University Hostel and the University E-Library. It is generally not used by other colleges; therefore, the use planning of the area is more focused towards the activities that will be done by the courses provided by the college.

Figure 6. CHTM Site Photos

Figure 7. CHTM Site Photos

Figure 8. CHTM Site Photos

The Flores Hall frontage area is a more public and is directly accessible to a wide of the university population. Even though it is highly accessible, the general activities for the area are mostly the same because it is the main administrative building of the university. This is where the various executive offices, human resources department, cashier, clinic, and registrar are located. There are queues consistently formed in front of the building for the whole year and it usually reaches the open area just outside of the covered area. This space presents an opportunity to be used as a classroom space during times that there are minimal queues. To maximize the usage of the area, general lectures and non-specialized activities can be conducted in the space because it is accessible to various colleges.

Figure 9. Flores Hall Site Photos

Figure 10. Flores Hall Site Photos

Figure 11. Flores Hall Site Photos

Figure 12. Flores Hall Site Photos

The College of Law and Canteen Annex area is a public and easily accessible with a variety of uses around it. Its vicinity includes the parking lot in front of the building, roadside on the East side, canteen area to the West side and an unused corridor in between it and the Laboratory High School building. There is potential in these spaces to be utilized for more robust and varied uses. The front area can be used as road, parking area, and open space with potential for classes to be conducted. It can be primarily used for lectures of the College of Law but is still accessible to colleges nearby. The back area can be used by both the high school and law school as classroom spaces, events area, and all-around open space. The side area fronting the canteen can be used as canteen extension and nooks for students. The side along the roadway can be improved as a more pedestrian friendly area for queueing persons and people passing through.

Figure 13. College of Law & Canteen Annex Site Photos

Figure 14. College of Law & Canteen Annex Site Photos

Figure 15. College of Law & Canteen Annex Site Photos

Figure 16. College of Law & Canteen Annex Site Photos

Figure 17. College of Law & Canteen Annex Site Photos

Figure 18. College of Law & Canteen Annex Site Photos

For the study, administrators of the selected sites were involved to use the tool both to give additional substance to the findings of the tool, as well as provide feedback to the functionality and relevance of the current iteration of the tool. Subsequent usage of the tool can include a more expanded user base. This will create a more robust basis for the design strategy to be implemented. The applications of design implementation strategy for the selected areas are done through schematic design drawings as recommendations from the enumerated strategies.

Indicators	Description	Observation	Assessment
Functional Considerations			
Flexibility of Area	Potential for flexibility of usage (lecture room or laboratory; course variety; non-educational uses; individual or group usage)	The area can be used for lectures, practical courses, eating area, and general open space for students, faculty, and	Area to be developed have to be flexible for the various activities, academic and non-academic, that the college
Size & Capacity	Up to how many students and instructors can be accommodated, given that the 1-m apart restriction is still enforced	Multiple areas can be used as rooms that can accommodate approximately 20 students for lectures.	Maximizing the space for capacity should not hamper with the robustness of the space.
Equipment Available	Teaching materials available in the area; ease of installation and potential of addition of teaching equipment in the area	There are no teaching equipments available in the area. The location is covered so equipment can be used/installed during class times.	Teaching equipment has to be identified and located to be cohesive with the design intent for the area.
Access & Accessibility	Entry points going into the area; provisions or difficulties for PWD users	The general area is accessible by PWD, however the flooring is not too even. There is a single entry towards the general area.	Make sure that the flooring is even and accessible for PWDs while the general area is still protected from vehicles.
Ventilation of the area	Functional ventilation of the area whether it is indoor or outdoor	The general area is covered outdoor space that is openly ventilated.	Maintain the area as open while protecting the users from rain and sun.
Population usage	Variety of potential users such as access to various academic programs and colleges	Students of CHTM are the primary users of the area. Users and visitors from the Hostel and E-Lib can also access the area.	The area has to cater primarily to the needs of the CHTM students and faculty.

Figure 19. CHTM Site Assessment – Functional Considerations

Indicators	Description	Observation	Assessment
Aesthetic & Environmental Considerations			
Materials Used	Existing usable materials (hardscape & softscape) that can be used	Existing materials are not recommended to be reused. New and more appropriate materials can be used.	Primary constraints on materials would be budget. Other materials should be resilient to vehicular usage.
Distractions Present	Current and potential distractions present in the area that might hinder the learning of students	There are no screens and the areas are exposed to pedestrians and vehicles.	The educational areas can have screens along the roadside that will reduce distractions during
Thermal Comfort	Comfortability of the area if used on a regular basis	The area is quite hot during noon time because the area is completely concreted. There are no trees in the area.	Additional trees can be introduced to reduce the heat in the area. The reduction of open concrete and heat retaining flooring materials can be reduced/replaced.
Environmental value	Presence of trees and types of the trees; usage of renewable energy or resource recycling	There are no trees in the area and no sources of renewable energy.	Additional trees can be introduced to reduce the heat in the area.
Safety & Security	Potential threats to the area; lighting of the area	The area is not too exposed to the public and the whole university is within a gated campus. The lighting of the area can be improved.	The area is near the University Hostel. There might be users during the evening in the area and giving additional importance to lighting.

Figure 20. CHTM Site Assessment – Aesthetic & Environmental Considerations

Indicators	Description	Observation	Assessment
Functional Considerations			
Flexibility of Area	Potential for flexibility of usage (lecture room or laboratory; course variety; non-educational uses; individual or group usage)	The area can be used as a queueing area, waiting area, and lecture room.	Robustness of the area is vital because of its key location.
Size & Capacity	Up to how many students and instructors can be accommodated, given that the 1-m apart restriction is still enforced	The area is spacious enough to accommodate a lecture class of approximately 30 students.	Maximize the area for seating for queues, if it is not used for class activities.
Equipment Available	Teaching materials available in the area; ease of installation and potential of addition of teaching equipment in the area	There are no teaching equipments available in the area. The location is open so equipment has to be easily transportable.	Teaching equipment has to be identified and located to be cohesive with the design intent for the area.
Access & Accessibility	Entry points going into the area; provisions or difficulties for PWD users	The area is open from multiple sides, however, the area is not currently accesible by PWDs.	The design of the area can provide access points for PWD users.
Ventilation of the area	Functional ventilation of the area whether it is indoor or outdoor	The general area is open outdoor space that is openly ventilated.	Provide protection from rain and sun while maintaining open air ventilation.
Population usage	Variety of potential users such as access to various academic programs and colleges	The area is very accessible to a variety of colleges, and programs.	Variety of activities and users will be the primary consideration for the design.

Figure 21. Flores Hall Site Assessment – Functional Considerations

Indicators	Description	Observation	Assessment
Aesthetic & Environmental Considerations			
Materials Used	Existing usable materials (hardscape & softscape) that can be used	Tables, benches, and brick pavers can be reused as well as the planting materials and existing "planter walls".	New materials would need to be complimentary to the reused materials. Existing tables and benches to be rearranged to match the activities of the area.
Distractions Present	Current and potential distractions present in the area that might hinder the learning of students	There are no screens and the areas are exposed to pedestrians and vehicles.	Additional visual screens are needed to maintain the focus of students when being used as a
Thermal Comfort	Comfortability of the area if used on a regular basis	The area is not currently covered so the area is very exposed to sun and rain.	An overhead structure must be constructed to protect users from rain and sun.
Environmental value	Presence of trees and types of the trees; usage of renewable energy or resource recycling	There are some trees around the area. There are not sources of renewable energy in the area.	Additional trees can be included to reduce the heat and improve ventilation. The area is fully exposed to the Sun. This creates potential for including renewable energy in the design.
Safety & Security	Potential threats to the area; lighting of the area	The area is exposed to the public but the whole university is within a gated campus.	The area is not expected to be used during the evenings. Minimal lighting for safety and security is recommended.

Figure 22. Flores Hall Site Assessment – Aesthetic & Environmental Considerations

Indicators	Description	Observation	Assessment
Functional Considerations			
Flexibility of Area	Potential for flexibility of usage (lecture room or laboratory; course variety; non-educational uses; individual or group usage)	The area can be used as a lecture area, eating area, waiting area, and parking space.	The area is accessible to various users so the areas must have flexible uses that are similar to the original uses.
Size & Capacity	Up to how many students and instructors can be accommodated, given that the 1-m apart restriction is still enforced	The area can be divided to accommodate classes that will contain up to approximately 30 students.	The area can be designed to hold bigger areas that can function as larger classrooms or events areas.
Equipment Available	Teaching materials available in the area; ease of installation and potential of addition of teaching equipment in the area	There are no teaching equipments available in the area. The location is open so equipment has to be easily transportable.	Teaching equipment has to be identified and located to be cohesive with the design intent for the area.
Access & Accessibility	Entry points going into the area; provisions or difficulties for PWD users	The area is open from multiple sides, however, the area is currently accesible by PWDs. Floorings of the area can be improved.	The most of area is very accessible and acts as a parking lot, therefore the safety of users is very important. Some areas are more hidden so accessibilty to them must be defined.
Ventilation of the area	Functional ventilation of the area whether it is indoor or outdoor	The general area is open outdoor space that is openly ventilated.	Provide protection from rain and sun while maintaining open air ventilation.
Population usage	Variety of potential users such as access to various academic programs and colleges	The area is very accessible to a variety of colleges, and programs.	Variety of activities and users will be the primary consideration for the design.

Figure 23. College of Law and Canteen Annex Site Assessment –
Functional Considerations

Indicators	Description	Observation	Assessment
Aesthetic & Environmental Considerations			
Materials Used	Existing usable materials (hardscape & softscape) that can be used	Existing materials are not recommended to be reused. New and more appropriate materials can be used.	New materials are recommended to reduce the heat generated by the hardscape areas.
Distractions Present	Current and potential distractions present in the area that might hinder the learning of students	There are no screens and the areas are exposed to pedestrians and vehicles.	Additional visual screens are needed to maintain the focus of students when being used as a
Thermal Comfort	Comfortability of the area if used on a regular basis	The area is not currently covered so the area is very exposed to sun and rain.	An overhead structure must be constructed to protect users from rain and sun.
Environmental value	Presence of trees and types of the trees; usage of renewable energy or resource recycling	There are some trees around the area. There are not sources of renewable energy in the area.	Additional trees can be included to reduce the heat and improve ventilation. Some areas are fully exposed to the Sun. This creates potential for including renewable energy in the design.
Safety & Security	Potential threats to the area; lighting of the area	The area is exposed to the public but the whole university is within a gated campus.	The area is not expected to be used during the evenings. Minimal lighting for vehicular safety and security is recommended.

Figure 24. College of Law and Canteen Annex Site Assessment –
Aesthetic & Environmental Considerations

The potential design application for the areas is facilitated by the design implementation strategies laid out for them. The output of the DIS table will serve as a reference for the creation of actual designs for the areas. In this study, each area underwent design implementation strategizing three times to formulate a more robust set of application strategies.

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Individual Factor considerations			
Flexibility of Area	Allow deployable equipment in the learning spaces	This will allow multiple kinds of activities to be done within the area, like flair-tending and table setting activities, etc.	Leaving an open space in between general seating areas for seats and other equipment.
Size & Capacity	Define spaces that can accommodate about 20 people for lectures and activities	This provides flexible spaces for different activities with permanent or movable screens to avoid overlapping	Define spaces using pavement materials and movable planters
Equipment Available	Provide seating area, movable tables and other movable equipment.	This will allow easy access to needed equipment for outdoor learning areas	Seating areas maybe fixed in some areas with provision for movable ones. Provide accessible storage for equipment.
Access & Accessibility	Define circulation pattern with direct access to outdoor learning areas.	Thiss allows easy and direct acces to outdoor learning areas by students and movable equipment	provide clear openings to outdoor learning areas with use of pavement material and movable planters
Ventilation of the area	Allow natural wind flow to pass through the area.	This will provide natural ventilation at different times of the year	Use movable planters with tall thick shrubs to provide a wind tunneling effect.
Population usage	Area primarily for the use of CHTM students and staff but can be accessed also by library users	Space configuration based on needs of CHTM students but can still be used by others from diff. Colleges.	Provide seating area, movable tables and other movable equipment.

Figure 25. CHTM Design Implementation Strategy – Individual Factor Considerations

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Holistic integration			
Materials Used	Outdoor learning spaces need appropriate materials for certain activities.	This will allow students to do activities such as flair tending, etc without damaging equipment.	Use of soft, impact resistant materials for the learning spaces.
Distractions Present	Delegate specific areas for learning activities to reduce distraction	This will define spaces that will allow students to practice without people moving around them.	Define areas for general circulation and for learning activities, provide soft screening
Thermal Comfort	Outdoor learning areas should be conducive for activities that is comfortable for the users	This will make the area comfortable or conducive for practice or training.	Designated outdoor learning areas can either be lawn areas or with artificial turf with appropriate overhead cover
Environmental value	Presence of trees and other vegetation for overhead cover and outdoor room delineation. Solar power for lighting.	Use of trees as overhead cover and shrubs as screens will generally improve air quality and temperature of the area.	Use of more trees and shrubs to define spaces... removal of unecessary concrete surfaces for better surface water absorption.
Safety & Security	Ample ligthing of outdoor spaces for safety even during nightime activities also for security of the area	This will provide better visibility in the outdoor learning spaces since existing lights are mostly within the buildings and building perimeter	Integrate appropriate outdoor lighting in all outdoor learning spaces.

Figure 26. CHTM Design Implementation Strategy – Holistic Integration

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Individual Factor considerations			
Flexibility of Area	Area to be used for a variety of activities, such as study area, area for waiting, queueing and filling out of forms.	Allows the are to be used depending on season, for studying by students and for outdoor queueing and waiting for official transactions.	Provision for open space for queueing that can be converted to study area with movable equipment. Provision for fixed seating area.
Size & Capacity	Area to accommodate 30 students in seated areas plus area for queueing/ waiting.	Allows the flexibility of the area usage depending on season. Enrollment season, more for queueing, waitng and filling of forms. Class season for studying.	Provide fixed seating area around perimeter of the space. Open space can accommodate movable seating or left open for queueing.
Equipment Available	Equipment required are seats and tables.	Fixed seating area around perimeter of the space for waiting. Open space can accommodate movable seating (for classes) or left open for queueing (enrollment etc)	Provide fixed seating area around perimeter of the space. Open space can accommodate movable seats and tables.
Access & Accessibility	Access for easy ingress and egress especially during enrollment season when area becomes crowded.	Allows for orderly ingress, queueing and egress within the area.	Provide ingress on one side and egress on the opposite side. With access to main circulation path.
Ventilation of the area	Allow natural wind flow to pass through the area. Provide shade.	This will provide natural ventilation at different times of the year for user comfort.	Use movable planters with tall thick shrubs to provide a wind tunneling effect. Plant trees for shade, Overhead cover for rain protection.
Population usage	This area is primarily for students queueing at the offices in the building. And for students in nearby colleges as study area.	Flexible use of the area depending on academic season.	Provision for fixed seating along perimeter and use of movable seats and tables for open space. Plant trees for shade, Overhead cover for rain protection.

Figure 27. Flores Hall Design Implementation Strategy – Individual Factor Considerations

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Holistic integration			
Materials Used	Durable materials for fixed furniture. Non slip and permeable materials for pavement.	Allows for sustainable and flexible use of the area.	Use of concrete for seating areas along perimeter, Concrete and wood for overhead cover. Concrete pavers for pavement with pattern to aid queueing.
Distractions Present	Allow for fixed or movable screen to fence off area from people walking and moving vehicles.	This will define spaces that will allow students to study with minimal distraction from surrounding areas.	Provision for movable or fixed planters with thick shrubs between 1.50-1.80 meters that will provide visual screen and reduce noise from outside.
Thermal Comfort	This area should be conducive for activities done here and comfortable for the users	Overhead shade/cover and natural wind movement will make the area comfortable or conducive for studying, queueing or waiting.	Plant trees for shade and provide movable planters with shrubs to allow the movement of air within the area.
Environmental value	Presence of trees and types of the shrubs; use of permeable pavement for surface runoff absorption; use of renewable energy or resource recycling	Presence of vegetation in the area generally improves air quality. Permeable pavement absorbs surface runoff from rain to help recharge ground water.	Additional trees can be included to reduce the heat and and shrubs improve ventilation and air quality. The use of concrete pavers on sand base allows for rainwater run off absorption.
Safety & Security	Ample ligthing of outdoor spaces for safety even during nightime activities also for security of the area. Provision for screening or fencing to secure the area.	This will provide better visibility in the outdoor learning spaces since existing lights are mostly within the buildings and building perimeter. Screening/fencing will prevent overflow of people to adjacent areas.	Integrate appropriate outdoor lighting in all outdoor learning spaces. Provide fixed or movable planters along perimeter to act as perimeter fence protection.

Figure 28. Flores Hall Design Implementation Strategy – Holistic Integration

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Individual Factor considerations			
Flexibility of Area	Use of the area for different activities such as studying, outdoor classroom, eating, socialization, etc.	Opening the area for various activities maximizes potential of the area for use by students.	Minimize use of area as car park and define spaces for certain activities.
Size & Capacity	Define spaces that can accommodate about 30 people for lectures and other activities	This flexible spaces for different activities encourages students to use the area.	Define spaces using pavement materials with patterns, planting areas and seating areas.
Equipment Available	Provide fixed seating areas and tables. Provide access for equipment when needed.	This will provide ready to use areas at all times, whether for studying, eating, lectures or just general socialization.	Provide fixed seating areas and tables and open spaces for flexible use of movable equipment
Access & Accessibility	Define circulation pattern with direct access to outdoor learning areas.	This allows easy and direct acces to outdoor learning areas by students and movable equipment	provide clear openings to outdoor learning areas with use of pavement material and planting areas
Ventilation of the area	Allow natural wind flow to pass through the area.	This will provide natural ventilation at different times of the year	Planting of additional trees for shade with fixed planting areas
Population usage	Area primarily for the use of students and staff of the College of law and surrounding colleges but can be accessed also by other students	Space configuration based on needs of students.	Define spaces using pavement materials with patterns, planting areas and seating areas.

Figure 29. College of Law and Canteen Annex Design Implementation
Strategy – Individual Factor Considerations

Indicators	Intended Strategy	Potential effectivity	Method of implementation
Holistic integration			
Materials Used	Durable materials for fixed furniture. Non slip and permeable materials for pavement.	Allows for sustainable and flexible use of the area.	Use of concrete for seating areas along perimeter, Concrete and wood for overhead cover. Concrete pavers for pavement with pattern to show circulation path and activity areas.
Distractions Present	Allow for fixed or movable screen to fence off area from people walking and moving vehicles.	This will define spaces that will allow students to study with minimal distraction from surrounding areas.	Provision for movable or fixed planters with thick shrubs between 1.50-1.80 meters that will provide visual screen and reduce noise from outside.
Thermal Comfort	Outdoor learning areas should be conducive for activities that is comfortable for the users. Use of overhead cover to provide shade.	This will make the area comfortable or conducive for all activities.	Designated outdoor learning areas can either be lawn areas or concrete pavers on sand base with appropriate overhead cover such as trees or trellises.
Environmental value	Presence of trees and types of the shrubs; use of permeable pavement for surface runoff absorption; use of renewable energy or resource recycling	Presence of vegetation in the area generally improves air quality. Permeable pavement absorbs surface runoff from rain to help recharge ground water.	Additional trees can be included to reduce the heat and and shrubs improve ventilation and air quality. The use of concrete pavers on sand base allows for rainwater run off absorption.
Safety & Security	Ample ligthing of outdoor spaces for safety even during nightime activities also for security of the area.	This will provide better visibility in the outdoor learning spaces since existing lights are mostly within the buildings and building perimeter.	Integrate appropriate outdoor lighting in all outdoor learning spaces. Provide fixed planting areas to define spaces and circulation pattern.

Figure 30. College of Law and Canteen Annex Design Implementation
Strategy – Holistic Integration

The following section contains applications of the design implementation strategies as envisioned by the researcher.
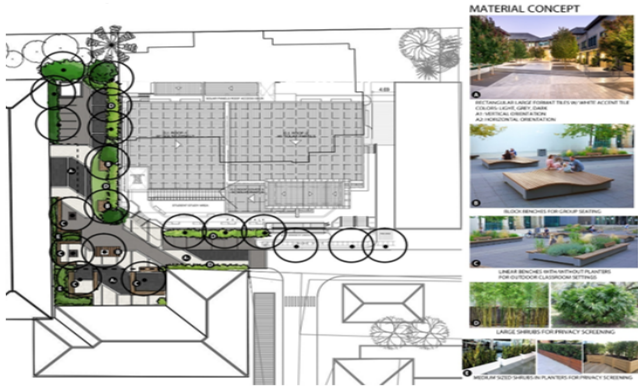

Figure 31. CHTM Plan and Material Concepts

Figure 32. CHTM Perspective 1

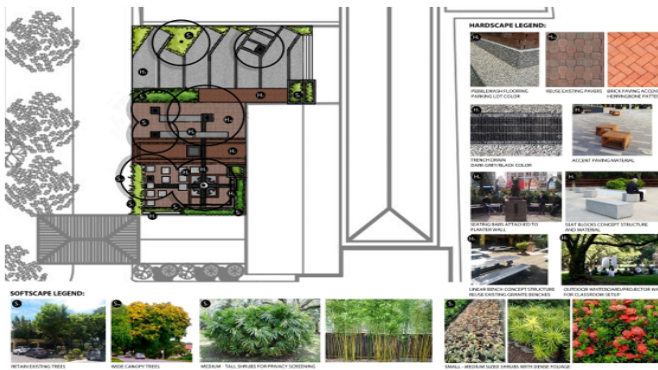Figure 33. CHTM Perspective 2

Figure 34. Flores Hall Plan and Material Concepts
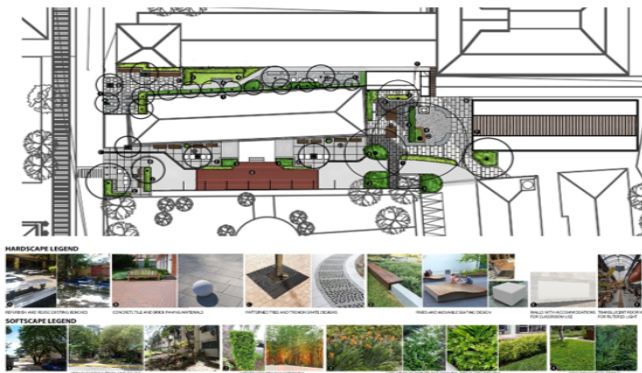
Figure 35. Flores Hall Perspective

Figure 36. College of Law and Canteen Annex Plan and Material Concepts

Figure 37. College of Law and Canteen Annex Perspective 1

Figure 38. College of Law and Canteen Annex Perspective 2

6   Conclusion

Outdoor learning spaces can aid in the improvement of academic performance by giving opportunities for classes to be more interactive and providing a different classroom experience for students. Outdoor learning spaces also provide improved resilience of spaces by being more compliant with COVID-19 space and ventilation requirements, such as open and natural ventilation. This will improve the university's resilience for future pandemics that would affect the use of closed airconditioned rooms. Existing outdoor spaces can already student activities like studying, eating and hanging-out, and their functions can still be expanded to accommodate lecture and

laboratory classes. These developed areas are flexible in usage and will provide for the open space needs in the campus. However, there are many considerations for integrating outdoor learning spaces in schools and universities. The proper implementation of these outdoor learning spaces should be properly facilitated and planned to reduce the potential wastage of development and maximize the budget a school would invest in them. The Site Assessment Criteria and Design Implementation Strategy Tables can guide the decision-makers by creating an inclusive methodology of assessing their areas that are potential outdoor learning spaces. It allows non-design professionals to join in the assessment process and come up with their suggestions on the improvements they have in mind.

7   Recommendations

Outdoor learning spaces can be implemented on a wider scale in other areas of the Bulacan State University. Subsequent studies can be conducted by all colleges for their general area. With the usage of the SAC and DIS tools, any location within the university can be considered for development and integration of outdoor learning spaces. Furthermore, in other schools or universities, areas outside of their general territory, and nearby, adjacent and accessible to them can also be considered although this might need additional or other indicators, and further coordination with the owner of those areas.

Once schools have initially integrated outdoor learning spaces into their campuses, educational and administrative policy recommendations can be adjusted to accommodate their new type of classroom. This will create a shift in the scheduling of rooms and adjustment of activities in the curricula of various subjects, creating a unique setup for the school to showcase their outdoor learning spaces.

8   Acknowledgement

9   Funding source

10   Conflict of Interest

The authors declare no conflict of interest.

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