“Spatial Organization of spaces for sociability Achievement within Universities”

(The Case study of Acton Campus, Australia & Kansas State University, USA, & Ain Shams University, faculty of engineering)

By
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A thesis for the requirements of degree fulfilment

Abstract- The paper discusses the importance of social interaction within urban spaces of campuses in general. The quality of space will not be possible without proper accountability to social needs in public spaces. Designing livable public spaces is by creating attractive urban environments, which are greatly active places and continuously visited by people. Campuses' urban spaces should promote social gathering and interaction; as well as hosting diverse activities for students, to meet their diverse needs. The problem of creating desired social interactions among urban spaces of campuses must be adopted by urban planners and designers. Sociability within campuses is valued significantly. The study of social life in small urban spaces comprised by campuses helps in enhancing the performance of students; intellectually, psychologically, physically and other aspects considered.

The highlighting of concepts of designing different aspects of urban spaces in diverse countries and analyzing their quality of performance in achieving the optimum quality of life for their users; specifically students, represents a major part in the final deduction of sociability preferences. Identification of all the factors, affecting the functionality of urban spaces, in an attempt to reach general characteristics that urban spaces of campuses should host; and must be compatible to the setting it exists in. The aim of this paper is that the urban spaces within campuses should function in a manner to create the exclusive lifestyle for students; serving as a catalyst for students to give their best outcome in education, psychological status; and definitely their health in general. Consequently, defining the general aspects for sociability achievement in universities is discussed in this thesis, in an attempt to reach the optimum configuration for social interaction manifestation within campus's open spaces.

Keywords- Factors of sociability in urban spaces, psychological needs of students, landscape elements of open spaces in campuses, urban design of campuses, students' interaction in open spaces, activities in urban spaces of universities, connectivity between spaces of campuses.

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1. INTRODUCTION:

Public spaces are an essential ingredient to the sustainability of cities for political, social, economic, public health and biodiversity reasons. Public spaces are identified in the form of streets, parks, squares; and recreational areas. They should be highly accessible and highly open to the public realm. The immense value of such spaces has made it greatly demanding; to specifically illuminate their components to meet the public needs.

Many functions incorporate with their components public spaces; that must be carefully designed, achieving the sense of continuing care, thoughtful decision- making, reverence for tradition and ritual, and a harmony of nature, landscape and architectural design. Spaces of Campuses; in particular; ought to be familiar, inviting, friendly and functional; encouraging their users; students in precise; to develop their educational capabilities, psychological behavior and their health in general. In designing campuses, details of urban spaces are greatly vital, as each take part in the creation of the optimum designed urban space, to attract the student to highly interact and socialize, achieving his best psychological status and thus encouraging him to manifest a high level of education, according to each gifted capabilities, surely. The diversity in design of urban spaces within campuses' premises ought to meet the different students' predilections. This diversity requires the allocation of different moods that ought to be compatible, yet complementing each other mutually, in each space.

Spaces of campuses must have the highest rate of safety standards and quietness, creating a sense of serenity within its realms. Segregation between vehicle traffic and pedestrians is of great determination, achieving the minimal appearance of vehicular lanes, inducing a feeling of familiarity to students; thus, encouraging student's long existence within the campus's lands, speaks of a great freedom of pedestrian activities and creating immense rate of social interaction.

All qualities that embody the character of the place ought to gather in a manner that makes universities as places of creative encounters. Diverse Components of urban spaces within campuses are to be studied in details to reach the best outcome of these spaces, in an attempt to reach a warm, cozy, and incorporating different but compatible functions; complementing the adjacent uses that the buildings compromise. The campus's environment conveys symbolic messages to its users, such as the value given to a department, or the degree of sense of belonging to the campus community; sitting areas near the student lounge that invite students to study or socialize together. Consideration of university space reveals the dominant cultures and subcultures that organize the institutional environment. Individuals respond to facilities and the environment, both in terms of attitude and behavior (Rapoport, 2005).

This thesis aims at studying thoroughly the existing urban spaces within different campuses, exposed to diverse environmental conditions, social aspects, cultural and religious needs. Analysis of such existing spaces targets the assessment of the student's performance and wellbeing status, even identifying the different perceptions of students to the urban space within his educational environment. The mutual analysis defines both the effect of the designed urban space on the student and the effect of student's needs on the final designed outcome. Both visions are totally essential to be identified to reach general factors that should be taken into consideration on designing spaces within campuses. The design selected ought to a result from the intersection of the two visions mentioned before. Three campuses are to be studied, identifying the physical condition, the layout of the campus, the organizational structure that provides order to the space and the landscape features within the open spaces. Applying the proposed sociability aspects on the three campuses and performing deep thorough analysis assist in inspecting sociability level manifested in their open spaces. Definition of specifications that enriches the open public spaces within any campus's layout is the goal of such study and analysis, in order to reach criterial conclusions that ought to assist any urban designer on creating a new concept for any University master plan that must comprise the aspects of sociability for all students and other faculty members.

Vision (1): Student's general needs

Vision (2): Typology of physical settings.
Both interact mutually to meet the optimum educational environment for the user (Student).

2. LITERATURE:

Social life of the community takes place in urban spaces. Sociability is strengthened within the context of urban spaces, through the achievement of a sense of security and trust within every inch of the space. Space and behavior, mutually affect the presence of individuals and enhances social interaction and community routines. Society experiences different aspects of the urban spaces, in an attempt to reach high levels of joy, happiness and self-esteem.

2.1 Sociability

Sociability in public spaces depends upon people's needs to affiliate with each other. "this affiliation involves people's participation in social systems to acquire psychological comfort", (LANG1994). Sociability in urban spaces is achieved by the accumulation of several factors:

- Uses and activities.
- Access and linkages.
- Comfort and image.

Sociability allows people to exchange information. Physical amenities are important to enhance sociability level. It involves diverse people with different cultural and social backgrounds. Thus defines people's role in community.

2.2 Significance of sociability

University campuses constitute multiple public spaces. However, how places are structured can facilitate or impede collective action. Tickamyer (2000) pointed out, 'the design of the campus and its surrounding areas could facilitate or impede demonstrations, protests, and other forms of social mobilization'. Therefore, all public spaces are not equal, and we should expect public sphere behavior to occur more often in certain types of public spaces than others. For an example, libraries certainly constitute a public space, either an internal one or adjacent to the building. Either is designed to meet the functional purpose of the facility, "library". Students go to libraries to read, study, and borrow books.

On a university campus, there are many open-access areas and diverse facilities (i.e., concert halls, museums, stadiums,, lecture halls, etc.). There are also open landscaped places including courtyards, quadrangles, squares, and terraces that are conductive to public gatherings. "Are there certain types of public space that host more social behavior patterns than others?"Gans(2002)focused on :the casual relation between natural space and social space. In Gans's (2002) use-centered approach to space, he identified land use, land values, location, density, propinquity, public space, neighborhood, community, and political economy as key concepts. In this research, the value of sociability within urban spaces of campuses universities is estimated through several tangible/ intangible aspects:

2-2-1 Physical realm.
2-2-2 Emotional realm
2-2-3 Cultural environment
2-2-4 Diversity
2-2-5 Environmental characteristics
2-2-6 Interaction of society
2-2-7 Health considerations

2-2-1 Physical realm:

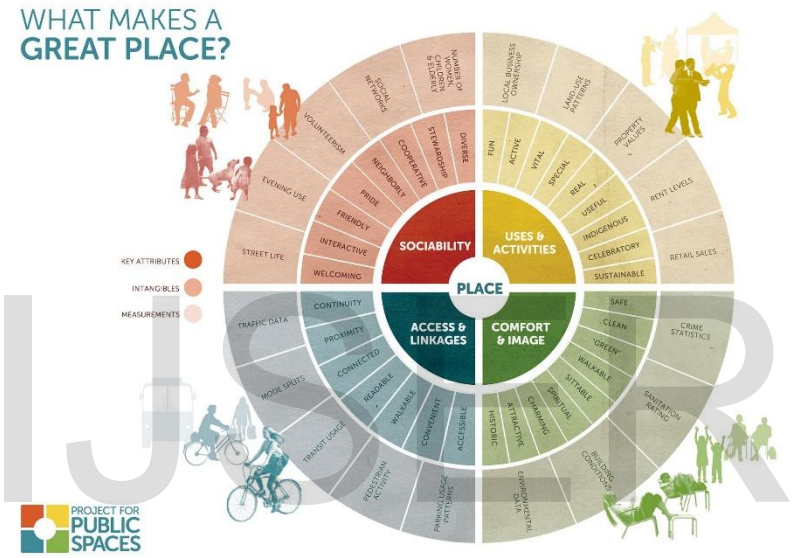
Tangible, corporeal, material aspects of the built environment, the physical components of urban spaces. Dimensions with substance that are mutable and can be touched, altered ad shaped. The Fulbright University of Vietnam acquires a distinctive physical realm, identified by the academic and student buildings that form the nucleus of the campus, surrounding the main public space of the university. The main gateway building will house a distinctive amphitheater located at center of the space, as well as the student center and library.

2-2-2 Emotional Realm:

The physical constitution of the urban spaces is greatly affected by the emotional preferences of the users. People and their relationships with each other, their sense of community and the differences in their experiences, regarding their background, influence the design in general, and manifest itself in every single detail of the formation. The constitution of the society, targeted to experience the designed urban spaces, should be thoroughly studied to meet their physical, emotional needs appropriately. The quality of a designed environment influences sociability in any public setting. The designed environment can be improved to provide better opportunities for human interaction. In a campus setting, the primary purpose of using a plaza is often for lunch and for spending time with friends and acquaintances, as a public space is a place where users can act more freely than when under constraints of home or workplace.

2-2-3 Cultural environment:

Urban spaces are infected in some zones with loss of character, due to its planning and design lacks deep understanding and respect towards city culture; and urban spatial planning is divorced from cultural planning. Integration of cultural planning and urban planning systems is inevitable.



Diagram(1): Main factors of Urban Spaces Design

2-2-4 Diversity:

The target of achieving different moods within an urban space, or within a network of designed hierarchal spaces, through including in the design outcome mixed uses, mixed functions and activities, and thus mixed experiences, is raising the quality of life for the users (students).

Creating easily walkable spaces, attaining energetic features and inducing positive energy, is the aim of the designer. Consequently, urban spaces in campuses universities should comprise activities suitable to assist the student to perform different functions in a comfortable social environment; such as work spaces, shops, entertainment activities, decorated to extremely convenient furniture, pleasant walking environment and mixed lovable experiences. Allocating relaxing zones within the spaces of campuses, such as meditation and listening to slow music, ought to be recommended, to alleviate tension and giving the chance for students to improve their moods and prepare them for their next learning sessions.

2-2-5 Environmental characteristics:

The study of location characteristics, regarding environmental aspects, is essential for better allocations of settings. Sustainability is the key to successful design. Durability of urban spaces is through the adaptability of the outer skin to the regional environment. Design criteria in spaces should meet the local environmental characteristics. Public spaces need to reflect distinct environments with their own socio-cultural context.

Historical value of a place is notable factor that can be engraved in the user's mind; as a result historical studies of the context is essential. Detailed environmental assessment of the location should influence the urban space design;

considering the dimensions of the different sectors within the urban space, ranging from building to furniture; all act collectively to generate a targeted sense of ambience that fits in appropriately within the surrounding context.

2-2-6 Interaction of society:

Stimulation of higher density of interaction among the users of urban spaces is essential. A communal space is the purpose of designing urban spaces, that should include:

- Appropriate functionality.
- Magnificent aesthetics.
- Convenient and comfort means.

Innovative urban spaces stimulate a higher density of interaction among the urban actors. Social sustainability is defined under the notion of healthy, productive, and coordinated life with nature; and is achieved if the design meets the needs, social equity, human dignity and participation.

2-2-7 Health Considerations:

Sustainable planning approach is highly recommended in the design process; taking into account the influence of environment on health, aiming at the reduction of stress, encouraging exercise and promoting health in general; physical and psychological.
The World Health Organization defines health as a "A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 2006).

By applying the aspects of sociability achievement on Campuses' external realm, deep practical apprehension is delivered to the designer and the reader of this research work.

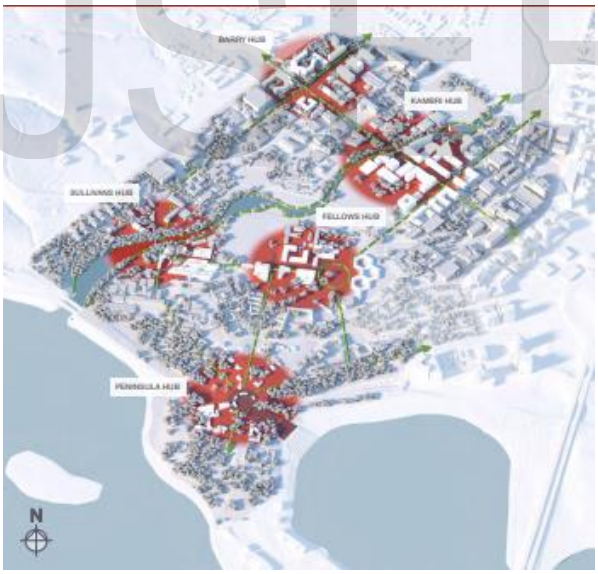
3. ANU Acton Campus, (The Australian National University):

3.1 Specifications of ANU:

The Acton Campus is in the heart of Canberra; (Australia's capital city). The campus comprises seven teaching and research colleges, in addition to several national academies and institutes. It was founded in 1946, originally targeting postgraduate researchers; but began to serve undergraduates in 1960. ANU enrolls 10,052 undergraduates, 10,840 postgraduate students and 3,753 employees. The university is particularly well- known for its programs in the arts and social science, and ranks among the best in the world for a number of disciplines including linguistics, politics and international relations, social policy, and land geography. It is extended within 358 acres (1.45 km2) of mostly parkland with university buildings landscaped within. The Acton Campus is well renowned for its landscape setting with many remnant and planted trees. ANU maintains over 10,000 trees, including over 500 of exceptional significance because of their age, history or species. Due to its centralized location, it is reachable from Australia's most significant political and cultural institutions including Australian Parliament House. (Map 1)

It comprises modern lecture halls, libraries, laboratories, student residences, and administration buildings. In addition, a small suburb including cafes, bars, supermarkets, child care, a news agency, post office, and finally a medical center.

Map (1): An Overview for the location of ANU Campus University



Map (2): The Five Hubs in ANU Campus University

3.2 Layout description:

It is a network of new hubs linked by landscaped promenades. The master pan comprises magnificent natural bush land setting; better recognition of its indigenous heritage, more successfully integrating architecture and landscape and making the campus more pedestrian and bicycle friendly, (map 3). The aim of its design is to achieve more coherence, more connectivity and more vitality, "Visible bones and joints". Residential accommodation built into the fabric of different parts of the campus is a great way of enlivening spaces. Acton Campus has an outstanding natural landscape setting and a collection of remarkable 20th century buildings. The design is anchored around five hubs, connected by tree-lined avenues that meet at points, enhancing a livable social center. Mobility strategy emphasizes greater ease of access and creating more pedestrian friendly green- heart.

Map (3): ANU Master plan showing the 5 hubs which are linked by landscaped promenades

The structure of the design is organized around seven principles contained in the ANU Acton Campus master plan:

1. Clearly defined hubs
2. Landscaped promenade links
3. Vehicle- restricted heart
4. Strong city connections
5. Harmonious distinctive design
6. Vibrant living and working environments
7. Environmental sustainability.

3.3 Submission of the studied Campus University to the seven principles previously mentioned in the literature of this thesis:

3-3-1 ANU Physical Realm:

Effective physical links ought to be attractive and inviting around the campus peripheries.
"ANU has an incredible landscape setting. It was recognized by ANU from the beginning that the best way to make a better campus would be through a focus on landscape and public realm, and this is the key feature of the master plan (Penny Hall, Integrated Design and Planning Lead, Australasia)". The university was established to be of enduring significance in the post war life of the nation; to the development of national unity and identity, to improve Australia's understanding of itself and its neighbors, and to contribute to economic development and social cohesion. The Acton Campus experienced a period of post war growth and consolidation, and includes buildings designed by some of that era's most prominent Australia's architects. Its renowned bush campus character was firmly embedded during the university's early evolution, with buildings set apart in open eucalyptus forest. At the same time, the campus also incorporated the character of Canberra's older suburbs, with seasonal trees planted along avenues and around the edge of a re-aligned Sullivan's Creek.

3-3-2 ANU Emotional Realm:

Harmonious ANU-distinctive Design aims at achieving consistency through the following:

- Establishment of common palettes.
- Respecting the natural setting
- Accentuate the unique values of indigenous and cultural heritage entities.

The main component of the ANU mater plan composition is the University Avenue, which runs from London Circuit until it terminates at Marcus Clarke Street. A paved pedestrian boulevard, a tree lined pedestrian walkway continues in the north direction until it reaches Union Court. Union Court is the main commercial and social hub of the University, where ANU bar, several cafes and shops, banks and other facilities are located. Only one remnant tree remains of the original patch in Union Court after it was refurbished in 1994. The previously mentioned components of the urban fabric of ANU strengthen the social, thus the emotional interaction between the diverse users of the physical composition.

3-3-3 ANU Cultural Environment:

A highly visible part of the ANU's Art collection is on its artworks and sculptures publicly displayed across the landscape. The concept of integrating works of art with the individual architecture projects to create a unique campus environment. "Works of art in a place of learning were considered to enhance the academic environment". The appreciation of sculptures continue to be a major part of the contemporary environment of the ANU. Some of the sculptures are nearly 50 years old and the collection continues to grow, with new works being commissioned. The earliest major work crested on campus is Gerald Lewer's sculpture "Relaxation" which was created in 1953 in conjunction with the design and construction of University House, which was designed by Brian Lewis: provides an outstanding example where artworks, sculptures and the design of fixed hardware and loose furniture is integrated within the architecture.

3-3-4 ANU Diversity and Social Interaction:

The campus possesses inherent strength that highlights the diverse moods promoted by its different compositions and surrounding environments; ANU has a clear vision of its future that aims at:

- Lively campus hubs
- Coherent identity and brand
- A positive pedestrian experience
- Streamlined traffic and parking
- A stronger connection to Canberra City

The clearly defined hubs present the opportunity to experience different moods their promenading and their psychological impact through spending time in each hub and trying out every single detail; these hubs are:

1. Kambri Hub
2. Fellows Hub
3. Peninsula Hub
4. Sullivans Hub
5. Barry Hub

The diverse potentialities the campus offers are:

- An exceptional landscape setting; the mixture of a bush campus setting, views to Black Mountain and Lake Burley Griffin, seasonal formal and informal plantings, and tranquil courtyards with water features concludes in a campus with landscape characteristics that is admired by the campus community and it becomes an attracting environment for the students.
- Proximity to civic, CSIRO, Lake Burley Griffin, the National Museum of Australia, New Acton, West Basin, and Canberra inner- city suburbs. This proximity creates stronger links to Canberra community; thus the opportunity to interact with diverse society.
- A collection of fine significant buildings: ANU comprises an impressive collection of heritage buildings. Common characteristics of these buildings are courtyards and loggias, which can form the basis for creating a more coherent collection of buildings in the future.
- Residential accommodation for the students.
- Areas of clearly structured public spaces: University Avenue- Children's Street- the edge of Sullivan's Creek-Ellery Crescent and Liversidge Street. All possess a well-defined, logical spatial ordering and a set of distinct physical characteristics, which provide underlying bones for a more logical public spaces network.

3-3-5 Environmental and Health considerations:

Underlying ecological and cultural values is apparent in the case of ANU. Cultural sites, landscape, areas of high ecological value and the collection of historical buildings are the key features of heritage value. Protecting, interpreting, and consolidating heritage values across the campus contribute in creating a distinctive campus environment. The ANU has an established approach to environmental sustainability. The Acton Campus is a microcosm of building types; there are some of 200 buildings on site, a large number with historic importance and heritage value. The ANU strives to achieve best practice in reaching sustainability and energy efficiency targets, above and beyond the minimum standards for best practice. The ANU has an important task to meet sustainability targets as set out in its Environmental Management Plan (EMP) within the framework of upgrading the campus and implementing development programs. An important component of the ANU's sustainability initiative is to retrofit (or retro green) its existing building stock where this possible. This initiative could be tied to opportunities of adaptive re-use and conservation of the cultural and architectural heritage of the campus. The ANU green program currently commissions research on a case by case basis for individual building on campus. To actively research and balance best practice outcomes for heritage conservation with sustainability.

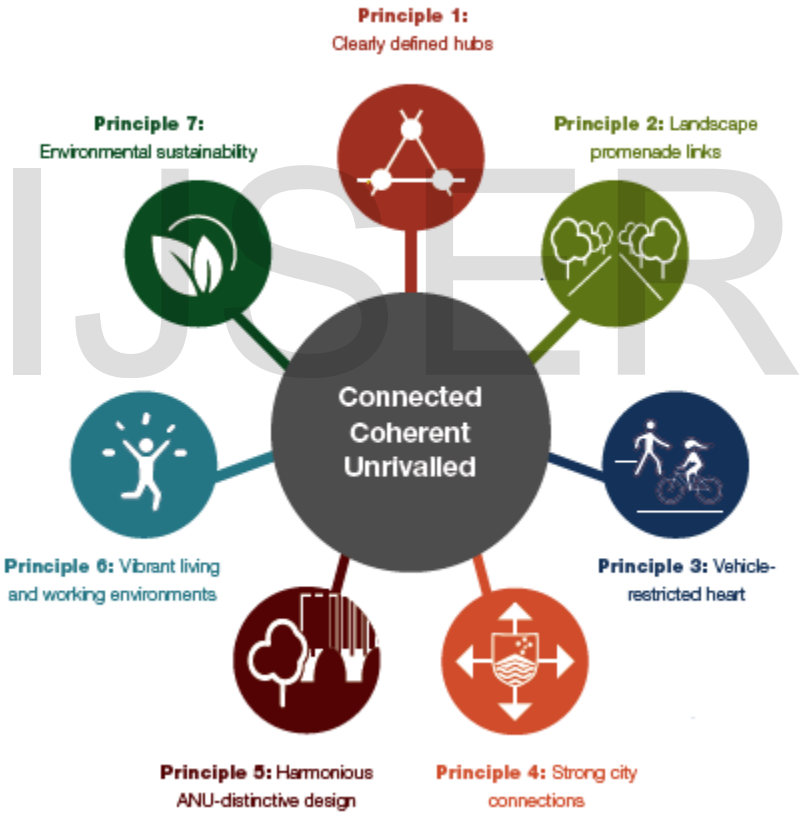


Diagram (2): ANU Adopted Principles

3.4 Conclusion from the overall study of ANU Campus University:

The overall University Plan and the great variety of buildings that it comprises, together reflect the myriad factors that lie behind their design and conception (diagram1). It is qualified with different planning ideologies, unique functional requirements; but the most significant quality of the campus does not lie in these structures themselves. It is not the architectural style, formal massing, or any material aspect of the buildings that unifies the campus and defines the university's predominant physical character. Instead, "**It is the spaces between the structures that are most important**."

4. SOCIABILITY FOR KANSAS STATE UNIVERSITY'S NORTH QUADRANGLE ACCORDING TO OBSERVATIONAL ANALYSIS OF USERS' BEHAVIORS:

Map (6): Aerial View from the South-West of the North Quadrangle

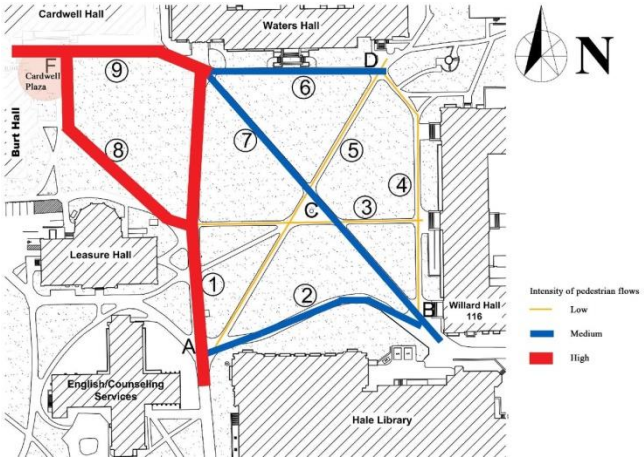
Sociability is manifested in the existence of quadrangles, which are characterized by large open green spaces that are iconic, enhancing the identity of the campus. These spaces provide gathering opportunities for both ceremonial and impromptu events. Pedestrian routes provide direct routes to, through and/or around these green spaces. The observations of users' behaviors in KSU's North Quadrangle targets thorough analysis to conclude a proposal for the plaza that is adjacent to Cardwell Hall. It is of great essentiality to gather observations of moving and resting behaviors, provided evidence for identifying potential spaces within the North Quadrangle to assist in designing and building. the observations of resting behaviors provided an understanding of sitting and standing areas in the quadrangle plaza. "A plaza is sociable if large numbers of people are to it informally in the course of their everyday activities and movements." As mentioned by William Whyte (William Hollingsworth

Whyte was an American urbanist, organizational analyst, journalist and people- watcher. He identified the elements that create vibrant public spaces within the city and filmed a variety of urban plazas in New York City in 1970s). The main aim of the design is attracting pedestrians traversing the North Quadrangle's busiest pathways drawing them into the plaza.

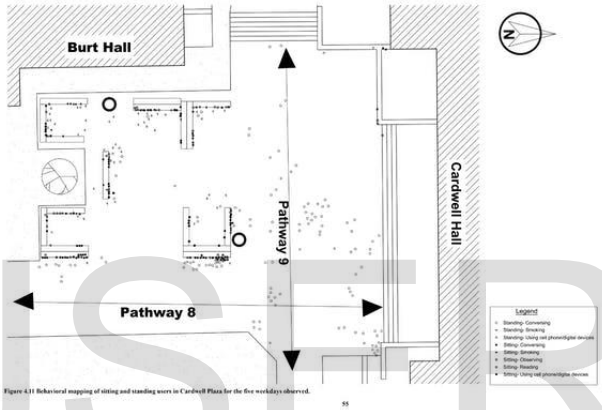
To promote plaza sociability, the design should include the most important plaza design factors identified by Whyte:

1. Location
2. Street-plaza relationship
3. Seating

First, the plaza should be located near large pools of potential users; second, the plaza should be designed as an extension of the most heavily trafficked pathways; and finally, the plaza should incorporate comfortable diverse seating experiences that should be of great compatibility with the activities happening within them. Consequently, the analytical diagram of the plaza studied identifies the levels of pedestrian density after deep observation of the users promenading through or near the plaza, which helps in highlighting the main pedestrian route from the secondary ones; thus, placement of different landscape features are according to this identification. (map 3,4)



Map (6): Layout of the North Quadrangle analyzingDensity of pedestrians



Map (7): Enlargement of a part of the North Quadrangle

Sketching the different landscape features that fit right through the plaza to achieve a clear vision of the outcome design, as a stage after analysis of users' attitudes and the digestion of all data collected and programmed within the designer's brain to come out in the form f creative sketches and the final optimum design for the plaza.

Map (8): The final design for the North Quadrangle

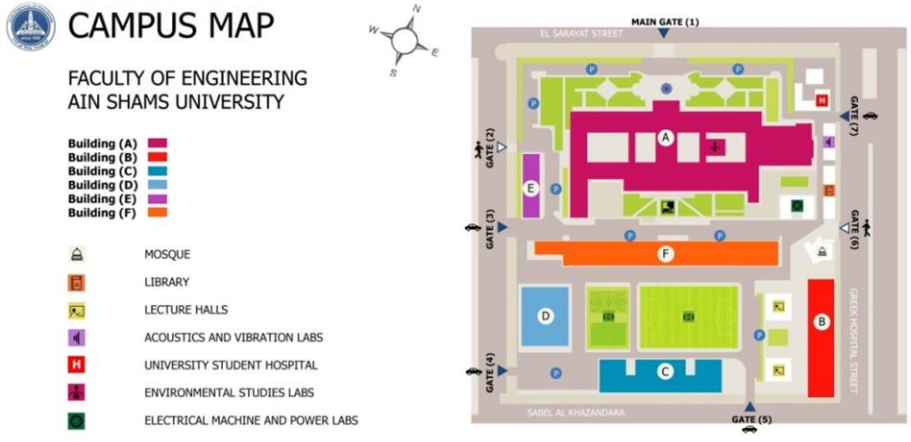
The conclusive design highlighted many aspects must be taken into consideration on proposals selected for designing sociable plazas:

- The importance of scanning the attitudes of the users; whether standing, moving, walking, gathering in a certain location; identifying the different times they promenade the plaza and gather, in order to perfectly select the detailed landscape features whether hardscape or softscape that strengthens the plaza vision in the users' brains as a comfortable environment for their assembly.
- The analysis of the data collected to aid the designer to vision the perfect design in his head and lay down several sketches for the different parts of the plaza that complement each other and magnify the importance of the activities performed by the users.
- Finally, the final design stage that demonstrates each and every single detail of the plaza highlighting:
    1. The pedestrian routes
    2. The diverse seating whether placed along the pedestrian routes or on platforms assigned for gathering
    3. Placement of other hardscape features according to the proposed design: water features, shading elements, sculptures and other entities that support the activities held within the adjacent buildings.
    4. Finally the softscape features: the usage of trees as shading element in gathering locations, the bushes and colorful flowers and plantation along the pedestrian routes; as the softscape plays an important role in creating a healthy environment for the students and boosts their psychological status.

5. Ain Shams University, Faculty of Engineering

5.1 Description:

It is the oldest faculty in Ain Shams University, and one of the first engineering schools in modern Egypt. In 1839, a school of Technical operations was founded which is due course developed and became school of Arts and Industries in 1932, then later school of Applied engineering. It continued to exercise its task until 1946 when a ministerial decree was issued giving the school the name of the Higher Institute of Engineering. When law no. 93 in 1950 was passed to establish Ibrahim Pasha University, the High Institute of Engineering became the nucleus of the Faculty of Engineering. The Faculty of Engineering, having completed its infrastructure and facilities, became one of the incorporated faculties of the University. After the 1952 Revolution, it was suggested that Egyptian Universities be given names that were strongly linked with the roots and historical landmarks of the country. Thus on February 21, 1954, the name of the university was changed to "Heliopolis", and then changed in the same year to its present name "Ain Shams', the Arabic name for "Heliopolis" or "O'n", which was the oldest university in history. "O'n" university was established about 5000 years ago, and it had a wide fame as a center of knowledge and learning , especially in astronomy, engineering and medicine; and so the faculty is known as Faculty of Engineering, Ain Shams University.



Map (9): Layout for Ain Shams University, Faculty of Engineering

5.2 Master Plan Description: (Map 9)

The layout comprises six buildings, four lecture halls in two buildings, a mosque, and an examination department building, where the library is located. The master plan encompasses diverse open spaces, visited often by students. There are seven gates at the peripheries of the Faculty. Four of which are vehicular admittance, while the others for pedestrians. The main building of the faculty(A) is of historical authenticity value, comprising the faculty administration and human affairs, main conference hall, engineering mathematics and physics department, mechatronic department, lecture halls and laboratories and other facilities. The main gate to the faculty is related to the location of the main building and centralized with its main axis, leading to a main entrance hall, covered by a significantly structured dome, infront of which lies the main entrance square "Dome Square. In contrast to building (A), building (B) was constructed in a modern architecture style, near gate "5" and comprises Architecture Engineering Department, Urban Planning &Design Department, Power and Electrical Machine Department, Engineering and consulting center, and lecture halls and labs. Four lecture halls situated in two buildings that were constructed in front of building (B) and bear the exact type of architecture style building (B) holds. The three buildings enclose upon one of the significant open spaces "Lecture Halls Square", and ought to be studied comprehensively. The main building (A) surrounds an open space, that is landscaped in a manner to accommodate students' activities and that significant, "Main Building Square"(3), is enclosed by some other complementary buildings that house several supplementary departments, as the examination department, the main library and a research center building. The master plan of the Faculty also comprises a longitudinal building form, 'Building F', where the central workshops and other Labs are located. Close to Gate'6', which is pedestrianly only, is the Mosque of the faculty, which encloses upon a triangular open space," The mosque Square" (2), that is surrounded by building 'B' and building 'F'. the Faculty is landscaped by three sports courts, located near building 'D', that accommodates Credit Hour Engineering Programs (CHEP), a multipurpose hall, and lecture halls.

The main aim of studing this specific faculty is to analyze the degree of successfulness of performance of four main open spaces within the layout of the Faculty, that have diverse locations, essentiality, landscape features, and near different indoor facilities. These four squares are as follows:

Lecture Halls Square
Mosque Square
Main Building Square
Dome Square (Main Entrance Plaza)

Map (10): A layout identifying the location of the studied four squares within the University

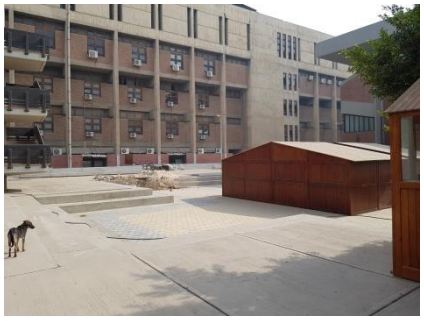
A questionnaire has been conducted to assess the degree of acceptance of these four squares by several students. The survey targeted the identification of the advantages and disadvantages of each square according to the point of view of the students, participating in the questionnaire. Each student is asked to rate the selected squares out of 10 according to his or her point of view or daily experience at the faculty, and state the justification beyond their rating, mentioning the deficiencies within each open space. Many Students delivered the questionnaire, but five of which were selected, as many held repetitive answers and assessment.

	Student's Prioritization & Rating			
	Square (1)	*Square (2)*	*Square (3)*	*Square (4)*
Student 1	*5*	*7*	*8*	*4*
	Square (1): near the Architectural Building and Gate '5'and nearest zone to food services. It is less shaded area, not centralized and has no enough comfortable seating features.	*Square(2): Communal space to discuss many things before leaving. Less lighted at night, no shading elements, and scary at night.*	*Square(3): Most favorable in terms of shading, seating, centralized, moderate congestion, but away from Architectural building; yet a good meeting area for students.*	*Square(4): Less centralized, of no much use, but lighted properly and acquires some shading elements, and aesthetically wise appealing.*
Student 2	*5*	*7*	*9*	*8*
	Not highly recognized and identified as an open space.	*Characterized by free of movement*	*very centralized, and connected to several uses within the adjacent buildings, accommodates various activities.*	*Comprise shading elements with seating availability .*
Student 3	*6*	*7*	*8*	*3*
	It is hardly a good urban area and mostly students of Architecture Department tread this square	*It is well connected to the rest of the campus, as different majors come to the mosque*	*Many students visit this specific square but it lacks flexible seating.*	*Distant from all lectures' location, very formal space and super connected to the dome hall and the auditorium, and these uses are hardly used by the students*
Student 4	*6*	*4*	*7*	*5*
		Uncomfortable, inconvenient for eating or studying.		*The space is isolated from other spaces and the shading elements are not efficient.*
Student 5	*7*	*4*	*8*	*7*
	Seating availability in the form of steps, several food	*A non-stable open space, uninviting to stay for a long time*	*Centralized, high connectivity, comfortable seating.*	*Many green spaces (lawns).*

	outlets			
Total	*29*	*29*	*41*	*27*
Percentage %	*58%*	*58%*	*82%*	*54%*

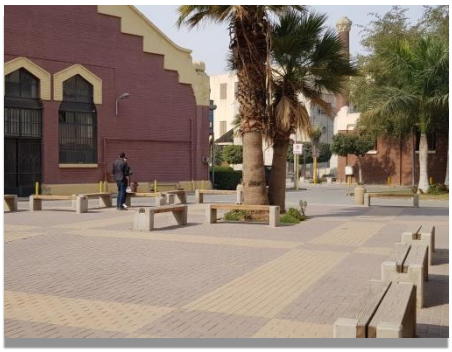
5.3 Conclusive Analysis for each Square:

5.3.1 Square (1): The Lecture Halls Square:



From the previous questionnaire, this open space is not appealing much to the students, except for the food services it provide, as no other square within the four studied squares bear this essential quality. Recently, two wooden structured kiosks have been built in this square to house the food services and and a future landscape design suggests the existance of seating areas surrounding them. That would in a way satisfy the difficiency of comfortable seatings, but unfortunately, no shading elements are suggested. The lack of greenary, even in the form of trees, that could have been a successful shading element, is obvious. The perfect location of this specific square should give it a great opportunity to be landscaped and designed as it is centralized between major lecture halls and in front of Architectural department building.

5.3.2 Square (2): The Mosque Square:

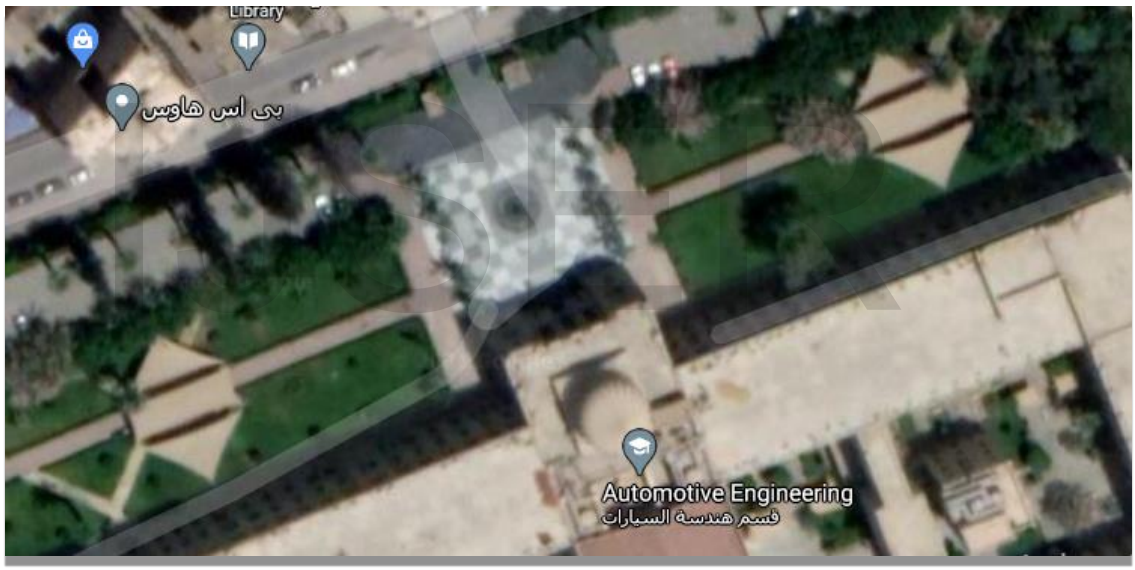

This square has the advantage of being close to the mosque of the Faculty, where most students from diverse departments call upon in different times of the day. This open space is quite centralized between architectural Department and other Engineering Department, but unfortunately, as it is clear from the above photos that the landscape features are entirely uncomfortable, whether regarding the seatings selected or the lack of shading elements, as most students find it hard to settle down in it for long period of times. The softscape is limited to two central palm trees that might be of an aesthetic impression rather than a functional one.

5.3.3 Square (3): The Main Building Square:


According to the previous questionnaire, this square is the most successful one among the four studied open spaces, as it acquires comfortable shaded seating areas and totally centralized within the layout of the Faculty, and students are able to perform meetings, lighted and securable at night and as well close to the Mosque of the Faculty. This open space is ornamented with diverse softscape from lawns, trees and bushes and represents a satisfying aesthetic value for students. Generally, it achieves the sense of belonging the students long for, especially its proximity to the Library. The peripheries of this square are shaded but the lack of furniture is obvious; as a result, these parts of the square are not efficiently used by students.

5.3.4 Square (4): The Dome Square:



This square is the least appealing one to students despite its high aesthetic value, as it is not properly, furnished, lacks shading elements, and de-centralized. Seating and tent constructed shading elements are reachable via the pedestrian route, initiating from this square. The façade overlooking this essential square spoils the degree of aesthetic and any activities of students carried out within this open space is entirely clear to the opposite residential buildings; thus, non-securable!
The softscape surrounding it enriches the beauty of the square; hence, students prefer it the least.

Generally, the open spaces within the faculty master plan ought to be evaluated and re-designed, adding more softscape and hardscape elements to make it more functional and meet the needs of students. Students must be the primary target of any design within the faculty and it is highly recommended to participate in the re-formation of additive features added to the design. The spaces should be flexible enough to house diverse activities and induce in them more sense of belonging.

5.4 General Comments on Ain Shams University, Faculty of Engineering Master Plan:

The layout of the Faculty is described as a hybrid of authenticity and modern architecture, a mix between the past and the present, despite their non-harmonious architectural patterns. The master plan bears several flaws that could be of great negativity to the wellness of the student performance:

5.4.1 The physical Realm:

The construction of the recent modern architectural buildings has added greatly to the creation of more open public spaces, despite their deficiencies whether regarding the softscape or hardscape features. The spaces in general within the layout are connected by pedestrian routes, and the pedestrian- vehicular segregation is succeeding to an extent.

5.4.2 The Emotional Realm:

The lack of convenience and comfort ability within most open outdoor spaces of the faculty raised the repulsive feelings in students and the spaces are unattractive to settle in.

5.4.3 Cultural Environment:

The main building of the faculty is of great authenticity value and gives the faculty a majestic elite richness; thus, it houses most of the valuable Departments and Halls. The main entrance, with a formal landscaped square exists with its main axis. Although the Architectural building with the lecture halls were added to the physical realm, unrespecting the historical value of the main building, but couldn't undermine the authenticity of it.

5.4.4 Diversity:

The diversity is only apparent in the surrounding buildings of the squares, as students visit the square only as they have schedules in the nearby lecture halls or labs. The under-designed open spaces couldn't be of attractive appeal to the users to experience its diverse moods.

5.4.5 Environmental characteristics and Health considerations:

The lack of green spaces within most of the squares makes the environment of the faculty unhealthy, physically and psychologically. The dome square is the only one that provides vast lawn areas, but as students commented before about its de-centralized location among the total master plan of the Faculty, which makes it un-useful for many students and they rarely visit the space. Many services are missing in the open spaces, and the lecture halls square are the sole provider of food services, but this square is decentralized as well. Shading elements should have been an essential feature in the designs, due to the harshness of weather in most of the year; the bottom-line is an open space without shading elements is entirely useless.

5.4.6 Social Interaction:

The most successful square is the main building square and sociability is achieved highly in it, as it is landscaped properly and provides diverse seating areas and sufficient shading elements, opposite to the other squares which are repulsive and uninviting.

6. The Sociability Formula for Campuses

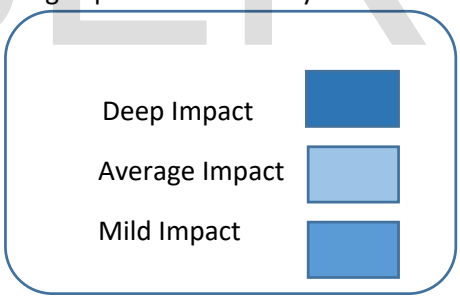
Specific factors helps in the achievement of the seven aspects of Sociability. Each factor influence deeply one or more of these aspects, and minor or none impact on the other aspects. Conclusively, the following table is composed of several factors that impact sociability and each is categorized to one or some of the aspects. Despite that, these factors merge mutually, complementing each other, creating the most sociable outdoor urban spaces:

SOCIABILITY PRINCIPLES / FACTORS OF IMPACT	Physical Realm	Emotional Realm	Cultural Environment	Social Interaction	Diversity	Environmental characteristics	Health Considerations
1. Adequate Distribution of buildings according to their contained specialty of education.	■		■		■		
2. Optimum Landscape features selection	■	■				■	
3. Achievement intimate relationship between the buildings and the surrounding landscape design.	■	■					
4. Analysis of students' attitudes	■	■	■		■		
5. Adequate selection of elements in the design to meet the taste of the public.	■	■	■	■	■		
6. Creation of several opportunities for gatherings	■	■		■			
7. Setting a questionnaire for the diverse public of students and staff members.		■	■	■			
8. Choosing colorful landscape features that moves the student's spirit		■		■			■
9. Respect for Historical Components.	■	■	■				
10. Extensions that suit the authentic existing physical realm	■	■	■	■	■		

SOCIABILITY PRINCIPLES / FACTORS OF IMPACT	Physical Realm	Emotional Realm	Cultural Environment	Social Interaction	Diversity	Environmental chraracteristics	Health Considerations
11. Respect for students cultures, traditions and needs; educational or psychological.							
12. A detailed design for each outdoor spaces, guaranteeing public gathering attraction.							
13. Involvement of students participation to increase emotional attachment to the place; thus sustainability							
14. Diversity of activities within each open space							
15. Respect for climatic conditions							
16. Involving landscape features that minimize the bad weather impact.							
17. Allocation of diverse outdoor spaces that connected by alternative routes (pedestrian, cycling and vehicular).							
18. Each space comprise diverse gathering points that is landscaped to suit the activity it houses.							
19. Facilitating the promenading of students in outdoor spaces by designing hazard-free landscape features.							
20. Involvement of staff members in the design selection for outdoor open spaces and creating their own open area, adjacent to their work place.							
21. Choosing native hardscape materials that are pollutant- free.							
22. Softsacpe placement is chosen carefully to facilitate the open space experience.							

SOCIABILITY PRINCIPLES / FACTORS OF IMPACT	Physical Realm	Emotional Realm	Cultural Environment	Social Interaction	Diversity	Environmental Characteristics	Health Considerations
23. Taking advantage of each environmental constituent of the selected location for campus project, to participate in the educational paradigm.							
24. Softscape features provide shade, colorful aesthetic impact, environmental cleansing effect and the spread of amiable odors.							
25. Water features selected in the landscape ought to enhance the soothing and relaxing mood, boosted by the activities the open space comprise.							

Table (1): Factors impacting Aspects of sociability



7. General Conclusions regarding the design of outdoor spaces within Campus's peripheries:

Theme	*Space Planning*	*Psychological Outcome*
Flexible and Innovative Space	Physical space should be able to mold and adopt diverse activities	The feeling of assurance that outdoor spaces will accommodate all the diverse activities students might need to accomplish in the open areas.
Collective activities	Open spaces design is to house several activities, complementing each other to strengthen the productive manner for the students.	The efficiency of the outdoor landscape design strengthens the presence of students outdoors without feeling the conflict of disruption from adjacent activities.
Compatibility of uses	Urban spaces design features should be compatible to the adjacent building uses.	The ability to perform the same activity indoors and outdoors to enjoy the exotic weather as much as possible
Compatibility of	Landscape elements ought to be selected	Students or other Faculty members become

landscape features	carefully to accommodate several activities that complement those within the adjacent buildings and give the students the opportunity to spend more time outdoors and perform their academic assignments comfortably.	more enthusiastic to be active outdoors, thus, more sociable. The mental health of students improves noticeably and hence, their academic performance advances consequently.
uniqueness	Each hub should have a unique design purpose to accomplish the diversity in activities. Hub for working, other for reading and resting, another for meditation and contemplation, another for festivalization and etc.	Each hub meets the taste of specific type of students. Each student is psychologically satisfied and his or her sense of belonging to the faculty increases.
Connectivity	All squares are to be connected through appropriately landscaped shaded corridors that are car-free and might provide lanes for bicycles.	Ideal connectivity provides freedom of movement with high sense of safety, the experience of pleasure existing in the pedestrian routes, and the protection from of severity of climatic factors.
Culture-Respect	Planning a distinctive campus design and architecture that respects any heritage if exists. Any recent or future addition to the layout of the campus, should not contradict with the authenticity and value of the old historical component.	Induction of Student's appreciation to history and increase their sense of belonging.
Sustainability	Optimum selection of durable construction materials and native landscape features, to avoid high cost of maintenance and decreasing pollutive resources.	The well-being of students and Faculty members is the primary concern in the design, resulting in physical and mental soundness.
Communal participation	Students' participation in the design selections and decisions adds greatly in accomplishing the perfect outcome. Taking into consideration the Faculty members opinion and identifying their needful perspectives induces an intense sense of belonging to the place.	The faculty becomes an attractive, appealing place for students. It becomes "A Happy Place" for them, where they have to keep its beauty, cleanliness, and flourishing quality.

Table (2): Aspects of Sociability and their psychological Impact.

8. Design Considerations for Campuses:

Giving superb attention to the design of outdoor spaces in Universities is of great importance as these public spaces serve the diverse students and should house flexible distinguished activities that are compatible and complementing each other and ought to have different effects on its users, and the following aspects should be taken into consideration:

8.1 Energy:

The use of ingenious technical innovations, renewable energy sources, and rigorous conservation and retrofitting is recommendable on designing campuses' squares. Linking the magnitude of energy choices to the scale of daily behaviors is essential. Energy structures serve as instructional landmarks on the campus landscape. Windmills, solar panels, and geothermal installations all require interpretive installations.

8.2 Materials:

The selections of sustainable materials that minimize energy-use, value resilience, achieve durability, and are recyclable.

8.3 Landscaping:

A college campus should comprise food producing, edible landscaping demonstrations. Lawns could be bisected by garden strips and framed with permaculture shrubbery. Rooftop gardens could supply food. The presence of small green houses is possible. The campus would then become a local and regional center for cooperative food growing efforts, a home for intergenerational, culturally diverse, bio regionally based experiments in food preparation and production.

8.4 Wellness:

Ultimately, the point of a sustainable campus is to provide a nourishing and supporting learning environment that promotes personal, community, and planetary well-being. Placed in an ecological context, the importance of biodiversity, atmospheric circulation, ecosystem services in relationship to the human community is highlighted. The idea of sustainability necessarily implies that human health is linked to ecosystem health. Yet, wellness also provides an extraordinary life-long learning opportunity. As a foundation for campus wellness, the master plan of any campus should be planned in a manner of encouraging workplaces and squares that generate reflective awareness about diet, nutrition, exercise, spending time outdoors, stress reduction, and meditative activities. A healthy campus is a more interesting and vital learning community, providing students with wellness habits and routines.

8.5 Curriculum:

Every college graduate should understand ecological and evolutionary concepts, and spatial and temporal variation related to environmental change.

8.6 Aesthetics:

The outdoor landscape is the best venue to interpret aesthetic manifestations including native plants, sculptures, recycled materials art sculptures, landscape artwork that captures the movement of water, grass and pollen. It is a terrific opportunity to get students, staff and faculty members engaged in taking great pride in the campus, as well as making the landscape much more interesting. Sustainability should entail aesthetics every step along the way. The people who live in the place should have the opportunity to make it their own through ephemeral and permanent artistic installations. This has the great virtue of making the campus amore vital and dynamic place. Even better, every art project contributes to the sense that the campus is a place in space and time, a living and working environment that represents an aesthetic mark in the bioregion.

It is preferable to have healing gardens where greenery and plants produce restorative effects. Flexible spaces to accommodate various activities according to students' needs, and green buildings that have open spaces as a catalyst for integrated eco-system. The outcome planning must be the product of intense consultation with staff and students and close attention to the standards set by the world's greatest universities. Integration of architecture and landscape, making the campus more pedestrian and bicycle-friendly ought to be the primal priority the conceptual plan for any University. In brief, Camus planning and design should adopt the three following principles:

More Coherence More Connectivity More Communal

The previous three principles ought to support the different attitudes manifested by students throughout their learning periods; whether moving through the space, standing and socializing, or resting in the space (conversing, reading, and smoking, talking on cell phones and using their digital devices).

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