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Qatar University Campus: Built Form, Culture and Livability

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Abstract Since the 1940s discovery of oil, the State of Qatar has experienced a rapid growth, which radically influenced the country's physical, economic, cultural and demographical status. Qatar became an independent state in 1977, after the end of the British rule. This paved the way for education: within the same year, the national academic institution, Qatar University, was established to allow Qatari students to study in their home country. In turn, in the past two decades, the State of Qatar has become highly competitive in the fields of construction, technology and education. The aim of this paper is exploring how and the extent to which the built form of Qatar University's campus (1) encourages the formation of enhanced levels of social and community interactions (i.e., social life) and (2) can be implemented in order to further enhance social interactions and/or livability. The study investigates the extent to which the public realm of the campus can be revitalized in order to enhance students' levels of social interactions. In order to reply to the main question, the system and setting of activities performed by students at Qatar University is explored and analyzed, through data obtained from (A) a survey, (B) students' interviews, and (C) visual material. The analysis indicates that the selected public open space around the campus should be implemented in order to encourage social activities and enhance livability in accordance with the preservation of the users' cultural identity.

Keywords Qatar University, Sustainable Urbanism, Human Behavior, Social Activities

1. Background

The urban planning process of Doha, the capital city of Qatar, began in the 1970s, when several multi-national consultancies started developing a master-plan guiding the urban development of the State. The first master-plan was designed and developed in 1974 by the British consultant Llewelyn Davis, who worked within the Ministry of Municipal Affairs and Agriculture. The following year, the Ministry commissioned the American planning consultancy William L. Pereira Associates to develop a new master-plan for the Northern District of Doha, also known as the West Bay district. It was in the Northern District of Doha that the development of Qatar University was formulated (Rizzo, 2014).

Planning a new academic institution for the State of Qatar included the participation of UNESCO, who conducted a preliminary study to foresee the conception of a higher education system with supporting physical facilities for the State. This resulted in the design of the campus of Qatar University under the guidance of the late Kamal El-Kafrawi, a Paris based Egyptian architect who was asked to propose a master plan of the campus with a distinctive style. The university grounds featured octagonal shaped classrooms topped by wind towers or wind catchers also known in Arabic as "Badgir" (Fromherz, 2012; Jodidio & Halbe, 2015; Salama, 2007).

The inauguration of the campus occurred in 1985, when less than 1000 students were enrolled: the university-campus received much appreciation for its design and architectural features. The campus, located 7km North of Doha and 2km from the Gulf shore, is situated on an elevated site. Currently the campus accommodates a central library, research complex and stadium along with the different college buildings, student centers, and recreational facilities, which include food courts, health care facilities and several central service units (Jodidio & Halbe, 2015).

The primary concept was to position academic buildings along the edge of the ring-roads that served the campus with sports and ancillary facilities on the exterior. The early buildings of the campus site were planned in a low-rise modular style constructed out of high quality concrete. The use of repetitive pre-cast structural elements could be seen as a fundamental concept of the campus. The academic buildings were based on octagonal grid layout of 8x4m in width and squares with sides of 3×5m. The modular pattern was repetitive and made using the octagons which were adjacent to each other and connected to the squares as seen in the plan (Figure 1). While examining the plan of the octagonal classroom module it is seen that each of the units is connected to two lobby spaces. The functions of these lobby

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spaces could vary where one can be used as an entrance lobby and the other as a transition space between classrooms or as an additional classroom space, while the other lobby acts as a source of natural light, which could also function as a meeting place (Fromherz, 2012; Jodidio & Halbe, 2015).

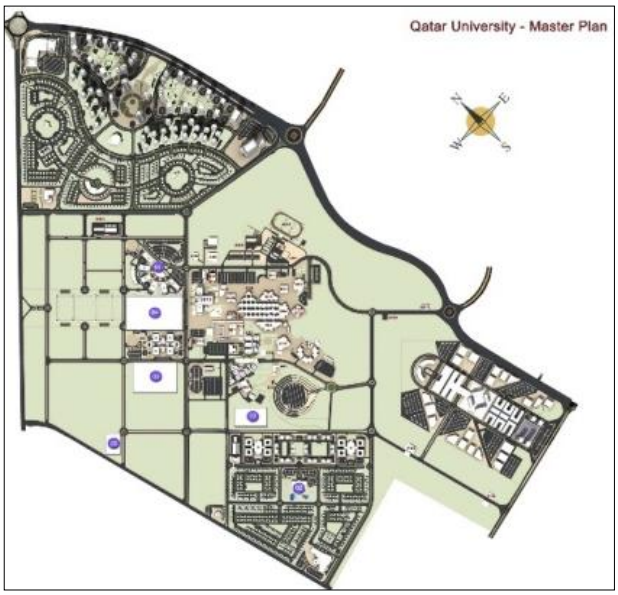

Figure 1. The master plan of Qatar University campus

Figure 2. A view of one of the educational clusters in Qatar University Campus

The octagonal modules are mounted by wind catchers to provide cool air to decrease humidity and allow for ventilation (Figure 2). Special design features include lighting towers to screen and filter the harsh sunlight. There is also the abundant use of 'Mashrabiyas' or wooden mesh screens that are placed in addition to some strategically placed stained glass windows. Landscaped courtyards with occasional fountains with open and semi-open spaces can be found in plenty throughout the campus. The idea of natural ventilation was emphasized in the design as a strong architecture and vernacular concept in the planning of the buildings. Despite the fact that the campus has grown exponential over the past 15 years with several expansions in addition to the construction of numerous new buildings, which differ in style and architectural treatment, the campus of Qatar University is still known for its iconic older buildings with "Mashrabiyas" and "badjirs" as their major design features.

The determination of the State of Qatar to create an image for the city of Doha through its architecture and iconicity can be identified in the buildings of Qatar University campus, where a visual expression is established between vernacular and traditional elements with the utilization of the contemporary and modern techniques (Furlan, 2016a).

Qatar National Vision 2030: Sustainable Urbanism and Urban Growth

Qatar University, as the leading national institution in terms of academic, scientific and technical development, has already moved and mandated to develop a greater understanding of the perception of Sustainable Development and to implement short and long term strategies to embed the concept in education and community. This has been well connected and linked to the 2030 Qatar National Vision (or QNV-2030). The National Vision for Qatar 2030 aims to move the State of Qatar forward by balancing the achievements for economic growth with human and natural resources. The Vision is aiming to build a bond between the past and the future, is based on the preservation of the society's ethnic and traditional values (as an Arab and Islamic nation), which reflects the family as the main support of society. Qatar's quick progress have shaped a link between old and new principles and ideals. This is one of the cardinal purposes behind QNV-2030, in response to the challenge of relating and balancing traditional values and modernization (Planning, 2008).

Qatar has made great advances and progresses towards producing a world class education structure coordinated through the Education for New Era reforms, which began right after the establishment of the Supreme Education Council, in 2002, and together with the restructurings of Qatar University, which began in 2003. Qatar University has been keen in forming graduates, which contributes to the sustainable development envisaged in the QNV-2030. It further ensures strengthening the national identity of the country through various disciplines in education, and motivates students by creating appropriate environments to meet the requirements of the students and the curricula (Planning, 2008).

Nowadays, terms such as sustainability, going green, or green building are coming up more often in specialized, professional and rational thinking discussions and debates (Farr, 2008). The importance of sustainable design focuses on the current society's trends and practices (Aasen, 2002; Brown, Dixon, & Gillham, 2014; Carmona, Tiesdell, Heath, & Oc, 2010; Day, 2003; Elsheshtawy, 2004; Furlan, 2015). However, the concept of sustainability has been around for many years. The definition of the word sustainability varies from author to author with multiple concepts and meanings revolving around a common aim and vision. Sustainability can be simply explained as refining and promoting the

economic productivity by protecting and restoring the ecological systems, while improving and enhancing the well-being of all peoples (Brown et al., 2014). The motivating forces behind the application and implementation of sustainability for creating a better and more sustainable future are various. These include betterment of the economic conditions, enhancing the indoor environment, limiting the use of non-renewable energy sources and controlling pollution, which affects climate change and ecological health (Farr, 2008; Givoni, 1989).

The way buildings and the built environment are constructed plays a dominant role to sustainable urbanism. Sustainable Urbanism is one of the reform movements of the late 20th Century that comprises of smart growth, new urbanism and green building movement. Sustainable Urbanism can be further well-defined and explained as a high performance infrastructure that promotes walkability and has a transit-served urbanism integrated with high-performance buildings (Kaspirin, 2011; Lang, 2005). It is important to note that the urban fabric that surrounds the building has to be designed in order to provide the arena where activities can be performed by the users and/or livability can be enhanced. Thus, Sustainable Urbanism deals with an amorphous set of concepts about how built form and cities place cane be shaped with the aim to enhance livability (Saliba, 2015; Zyscovich & Porter, 2008).

Transitioning to a Sustainable Smart Campus

In the Brundtland Commission's Report released in 1987, sustainability is defined as the development that meets the needs of today without compromising the ability of future generations to meet their own needs. The three pillars of sustainability include environmental, economic, and social subjects (Furlan, N.Eiraibe, & AL-Malki, 2015). Therefore, a sustainable campus can provide the physical setting for the high quality of life, while valuing the necessity to preserve natural resources and safeguard the natural environment. Transitioning to a successful campus or green campus involves the support of the university community, namely the students, faculty members and administration, and finally the local community. Therefore, in order to achieve sustainability within a university campus, all departments need to play a role to coordinate and initiate projects towards the achievement this goal.

Smart campuses should be a live model of sustainability by providing learning experiences to students, staff and faculty alike, which in turn can be extended to the community. Universities should be referred as hubs and cores that develop training, education and accommodate the requirements of all learners. The physical setting should be a symbolic center for the community, which contributes to promoting sustainability. The educational and academic life of a student circles around intellectual, social and individual activities (Figure 3). Each set of activities requires specific spaces, boundaries and interconnecting areas.

In order to achieve sustainability, campuses should aim at improving the natural environment, namely the land, water and air quality. Clean air can be bought in research and learning buildings through the use of non-toxic and/or low-toxic materials, the use of natural, passive and high quality mechanical ventilation systems. Environmental quality can be improved by promoting a livable and peaceful campus landscape restricted from road traffic. This promotes and encourages a quiet atmosphere for learning and studying. Campus Greening also inspires the design and planning of public parks, gardens, campus plazas and recreation amenities as well as preserving natural resources. The university community must be well-challenged to rethink, recreate and change grounds of environmental policies and practices in order to contribute to providing a sustainable campus at local, national and international levels.

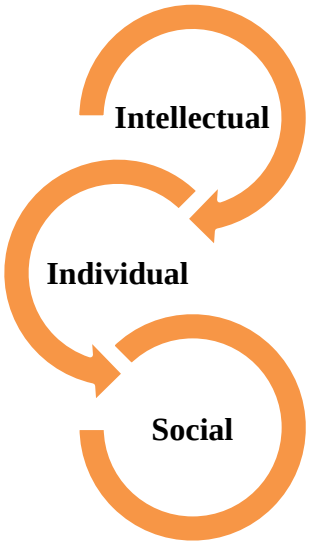

Figure 3. Educational/Academic Life of a Student

Socio-Cultural Variables and Activities

QNV-2030 clearly states the preservation of cultural values through its policies, plans and strategies. In addition, as Kent states below:

Culture is a theoretical construct. No one has seen or ever will see or observe culture - only its effects and products… 'Culture' exists by definition: it is a conceptual summary shorthand (and proposed explanation) for particular conjugations of a great variety of human phenomena (Kent, 1997, p. 10).

Qatar University Campus was planned and developed in consideration of climate and local cultural aspects. The concept of culture was dismantled in an ethnic frame, shared by a group, encompassing cohesion and commonalities, based on a historic and traditional context. As Kent highlighted in the quote above, culture is an abstract concept which must be further clarified by dismantling it into more concrete components or variables. Kent and Rapoport refer culture to socio-cultural variables. Nevertheless, they stress that the concept of socio-cultural variables still remains as an abstract. Therefore, they highlight the importance of breaking the concept down into more specific and concrete

terms (Kent, 1984, 1990). More specifically, Rapoport makes a distinction between two distinctive components, which are both manifestations of culture: social and cultural variables (Figure 4). As Rapoport and Kent (1997; Rapoport, 1969, 1982a, 1982b, 1984, 1997, 2000) emphasize, the concept of culture, as a way of life, leads to a system of activity: activities are direct expressions of a way of life and ultimately of culture.

Built environments are created to support users' desired behaviour and … if the architecture encloses behaviour tightly, then activities will tend to shape architecture (Kent, 1990, p. 11).

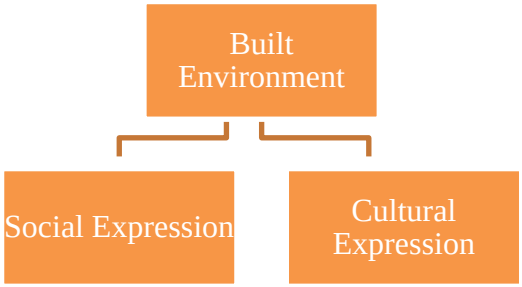

Figure 4. Expressions of the Built Environment

Built environments are reflection of behavior, which has to be considered in the context of activities. The built environment can be studied at various geographic scales starting from the building scale to the site scale reflecting it further down to the neighborhood and regional scale. The focus of this paper is primarily at the first two levels with relevance to the physical activity at the building and the site scale. For the purposes of this study, physical activity is categorized into walking, studying, socializing and food consumption.

The main reason for students to utilize the outdoor areas within the Qatar University Female Campus is to conduct the activities listed above. Scholars argue that activities are key elements in terms of activating and shaping spaces. The study of activities can also provide a better understanding of how to enhance the livability of spaces.

The utilization and distribution of spaces could be examined in terms of the activities conducted in theses spaces and vice versa. "Built environments are created to support users' desired behaviour and … if the architecture encloses behaviour tightly, then activities will tend to shape architecture (Kent, 1990, p. 11)." From this statement, one can arrive at the conclusion that if activities can determine the architecture of spaces then through the architecture that supports the activities one can as well utilize the space. Therefore, an implementation of elements contributing to the enhancement of the activities will contribute to making the space more livable.

In addition, Rapoport stresses the importance and the need to dismantle the concept of activities into its variables. Rapoport classifies six components, which in his interpretation, are the representation of the activities system, based on the questioning elements. The six components are based on What, Who, Where, When, How, and Why. These are defined as (1) The nature of the activity itself (what), (2) The persons involved or excluded (who), (3) The place where it is performed (where), (4) The order or sequence it occurs (when), (5) The association to other activities (how), (6) The meaning of the activity (why) (Rapoport, 1969, 1982a, 1982b, 1997, 2000). The spaces are analyzed in terms of the activities performed within it, for better understanding of how the usability of the area can be implemented in order to allow the users to performed the required activities (Furlan, 2016b; Furlan, Eissa, Awwad, & Awwaad, 2015; Furlan & Faggion, 2015; Furlan, Muneerudeen, & Khani, 2016; Furlan, Nafi, & Alattar, 2015).

Spatial Patterns and Cultural Identity

Early Islamic Arabs were nomads and would travel with their livestock from location to another in pursuit of the means of life. The Islamic Arabs would have a tribal culture. Each tribe had its own identity and would settle in in a fixed location. The patterns of these nomadic settlements had elements that are currently present within Islamic Arabic Cities. Settlement patterns of the nomads would be characterized by large clusters of tents in a Valley (Wadi). In turn, this type of settlement emphases the identity element of Islamic Arabic Cities (Petruccioli, 2007; Petruccioli & Pirani, 2003).

In the centuries, tribes expanded and formed large and modern Islamic Arabic cities, where the cultural identity, rooted in the early Islamic Arabic settlements, can still be identified. Settlement patterns of the nomads would be placed within these large clusters in remote distances from one tent to another. The idea behind this spatial configuration has a link to the initial element and the material of construction. One of the key factors influencing the settlement is the need for privacy. In order to maintain privacy the tents had to be located in areas that would allow each family within one tent to maintain a sense of privacy and property. The material utilized for the construction of the tents was wool: therefore privacy could be achieved by keeping an appropriate distance among the tents. Privacy is one of the key-factors influencing the formation of the Islamic Arabic city: evidence of this can be widely seen in the built form of modern Islamic cities. Tough, with the introduction of new solid materials it was possible to cluster buildings closer together and concurrently maintaining privacy. The minimum windows and openings within these clustered houses and buildings within any Islamic Arabic city contribute to preserving privacy (Benninson & Gascoigne, 2007; Coulson, 1964).

Identity and privacy are undoubtedly two dominant key-factors, which impacted on the formation of Islamic Arabic cities. As time proceeded, the city would form and morph in order to respond to new typologies of buildings. Markets, example of this phenomenon and evolution, contributed to the formation of public and private quarter around the city, where the spatial segregation of males and females was maintained and became a way of life and/or part

of a cultural identity. Significantly, gender segregation is one of the vernacular characteristics considered of key importance to the architecture and spatial form of the Islamic city. Therefore, it is argued that contemporary urban designers and architects should maintain the spatial urban patterns, which have been identified as Islamic and belong to the way of life of the Islamic cultural group.

2. Methodology and Data Collection

In order to investigate the extent to which livability and sustainable urbanism can be implemented within the physical setting of Qatar University's Female Student's facilities, oral data was collected from students of the College of Engineering through a survey. The oral survey was structured into three parts. The first part aimed at identifying whether students preferred outdoor to indoor spaces and the location of such spaces. Among 40 students who participated in the initial part of the survey, 26 students preferred 6 outside locations. These locations, listed in order of most desired, are the Engineering Building and Female Building space, the Engineering Building and Food Court space, the Engineering Building and Activity Building space, the Science Building and Female Building space, the Science Building and Activity Building space, and the Engineering Building and Sharia Building space. Namely, the Engineering Building and Female Building space were selected by 13 students; the Engineering Building and Food Court Space was selected by 11 students; the Engineering Building and Activity Building space was selected by 8 students; the Science Building and Female Building space was selected by 8 students; the Science Building and Activity Building space was selected by 5 students; and the Engineering Building and Sharia Building space was selected by 3 students (Figure 5 and Figure 6).

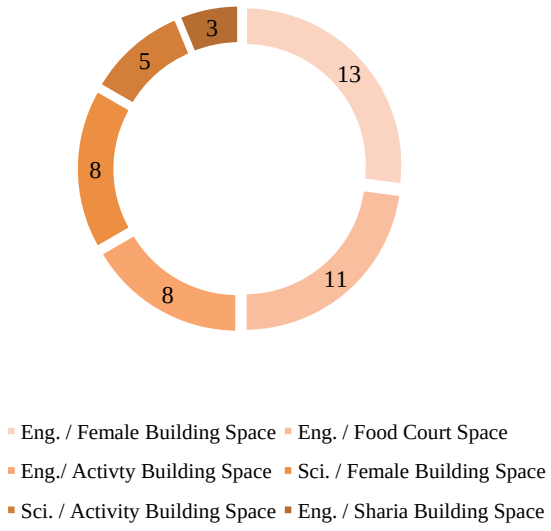

Figure 5. Selection of Spaces by students

Figure 6. Female Campus Map

A Campus site analysis was done to better understand the site inventory (Figure 7). Afterwards, the investigation focused on better understanding of the type of activities that students would engage within the identified open spaces during their free time. Students listed four main activities: Walking, Socializing, Eating, and Studying. Walking was selected by 21 students, and this is identified as a casual walk among friends and preferably in a shaded location at a slow pace. Socializing was selected by 15 students, and this is defined as talking or watching media with friends on mobile phones or laptops. Some student would be seated and others are standing. Eating was selected by 11 students. Studying was selected by 5 students. Usually this task would be done seated. Additionally, 3 students selected other activities (Figure 8).

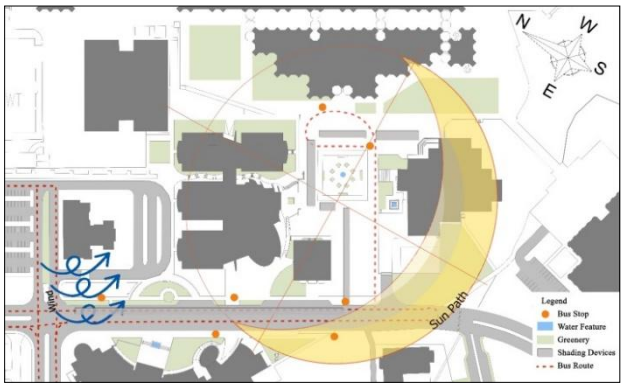

Figure 7. Female Campus Site Analysis

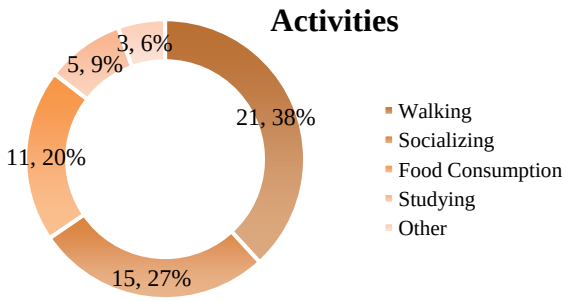

Figure 8. Survey Results for different activities

The third part encouraged students to highlight how to enhance livability within the identified areas. Afterwards, students were interviewed in depth about activities performed within the identified areas as well as their suggestions about how to implement these commonly used outdoor campus spaces and/or in order to enhance livability, and finally to create a sustainable built environment. Four main elements were found to be the most occurring from the students' feedback. These elements are Shading, Refreshments, Seating, and Security. Shading was selected by 24 students, and this was identified as a lack of shading whether vegetation or human-made elements of shading. Refreshment was selected by 17 students, and this is identified as a location for a small movable kiosk that could sell refreshments. Seating was selected by 9 students. Students claim that the seating areas provided are not sufficient. Lack of security was selected by 5 students. This is identified as lacking in locations located far away from campus and open to strangers, as well as within areas experiencing traffic congestion (Figure 9).

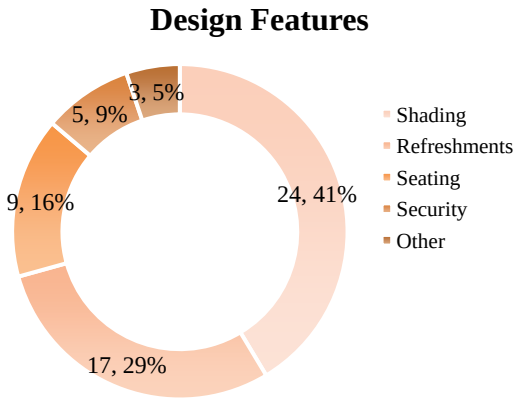

Figure 9. Survey Results for different design features

3. Findings

The findings, revealed thought the analysis of the collected oral data, are structured into 3 locations, as selected by the selected students-participants.

Location 1

The first listed area is represented by the Engineering Building, the Food Court, the Engineering Building and the Sharia Building area (Figure 10). Regarding size, this is the largest outdoor space on the Female campus. This area, the main social hub for the students, is of high importance because there are busses passing by the buildings and dropping students. This area also serves as a main connection to the food court building.

The lack of activities in this area creates the largest problem regarding use of the space. Many students identify this area as lacking in terms of activities. The main reason for this is the position of the buildings and the connection of a passageway for busses' drop off and pick up. The buildings arranging along this threshold have potential regarding activating the space. The food court is a good example. However, there is no treatment to activate this space. The passage way passing between the buildings defines this space. The fact that there is constant bus traffic contributes the lack of activities within this space.

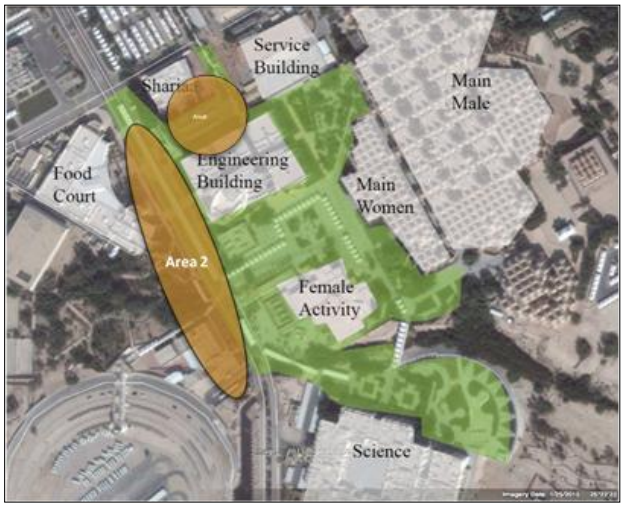

Figure 10. Location 1 Map

The lack of security within the area is also a major issue. This is identified as not having some boundary to the space as well as some sort of control for the transportation frequenting the space. The issue of the boundary is crucial for the students that will use the area. The students have a need for privacy and security when space is vast in nature. The lack of boundaries is seen as unsecure and unsafe and therefore contributing to keeping the students away. Seen the busses passing to pick up and drop off students, students crossing the area sometimes have difficulties regarding walking around the busses and feel frightened by the large size of busses.

With these elements in mind the suggestion is as follows. To create a pedestrian realm neighboring the bus traffic a separation should be provided. Having a layer for pedestrians and bus traffic would create a much needed disconnection of the two entities. A clear separation of the pedestrian area into different conduits for the busses, pedestrians walking, and people with disabilities would avoid a clash between pedestrians and transportation tools and provide a safe walkway (Figure 11). By doing that the student will feel comfortable to move and walk within the disconnected pedestrian realm and will use this place more. Once the disconnection of the space happens, the next step would be treatment: shading and confining the spaces are the elements needed based on the problems identified. Adding natural element as a shading device like trees that will effectively shade the place and add beauty to it as well as act as a confining element, create micro spaces within the larger space that will allow students to situate themselves within these smaller confined space since a sense of security will be provided. Creating an interesting landscape with fountains and greenery seating areas will attract the students.

Resolving such issues would lead to enhance livability within this area (Figure 12).

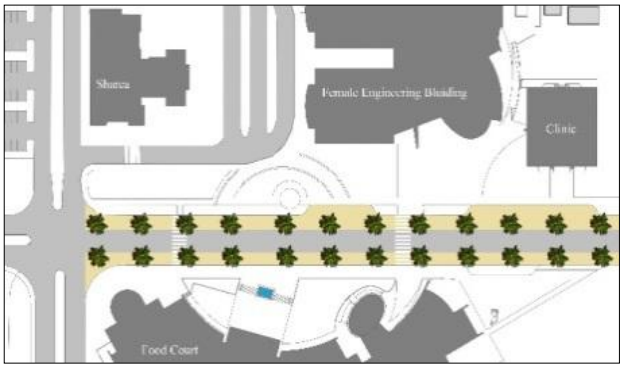

Figure 11. Proposed Architectural Design Solutions in plan

Figure 12. Proposed Architectural Design Solutions

Location 2

The studied area encompasses three smaller similar areas, which are the Engineering Building and Female Building space, the Engineering Building and Activity Building space, and the Science Building and Female Building space (Figure 13). This area has the most connections from the campus buildings so it acts as a connection from classes to each other. This area acts as the main landing ground for many of the students during their break time after their classes, because the areas are adjacent to the campus buildings where classes are held.

Figure 13. Location 2 Map

This area has the potential to be the most active student campus center on the Female campus, being the area surrounded by four major college buildings that hold most of the classes throughout the day. This area, which has many foot traffic regarding students traveling from one class to another, also acts as a connection and mixture space where many of the student and their friends meet with the teaching staff. With all of this potential yet it is seen that the students do not spend most of their time here when they have some free time. This is understood as there are factors that hinder the use of the space. Heat and the sun act as driving forces to push students away from these locations. Most of the students interviewed identified the area as a hot and unshaded area. The exposure to the heat encourages students to quickly leave the area.

This heavy-traffic area has the potential to hold these students that pass by the area to get to one building to another. However, many students highlighted that the area is lacking seating arrangements or tables. Many students exit the surround buildings to the area and revise what they took in class. Some students wish to do homework or study before their class as well. The lack of sun-shaded seating and tables do not allow students to stop by and/or to make the area livable.

There any several solutions, which could help resolve these issues and make this area a livable and comfortable place to frequent and use. The first suggestions are to add chairs and benches in seating areas that promote gathering and shape it as a natural seating area, so that students feel comfortable by sitting near the grass and shading trees. The area should be equipped with (1) efficient shading devices allowing the students to use the area along the all day; (2) vending machines and/or kiosks for food and drinks distribution/service, which will act as a gathering elements helping students to be hydrated even when passing between buildings and/or invite them to stop by; (3) supplementary natural elements such as trees (Figure 14 and Figure 15), which would provide shade and at the same time would enhance the livability of the environment. The replacement of old chairs and tables would also contribute to making the area more comfortable, usable and finally enhance its livability. These areas would be extensively utilized for activities such as studying and social gathering (Figure 16 and Figure 17).

Figure 14. Proposed Plaza before Architectural Design intervention

Figure 15. Proposed design features in the plaza after Architectural Design intervention

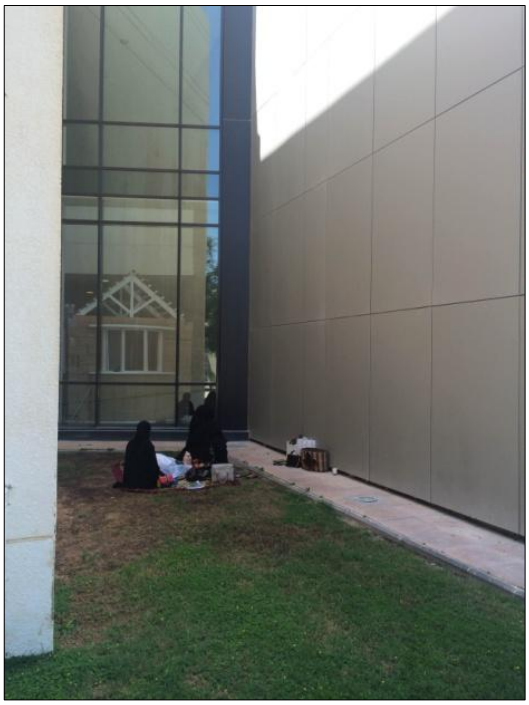

Figure 16. Students utilizing the shaded area between buildings for eating/relaxation activities

Figure 17. Students seeking for outdoor shaded areas of the plaza for reading/studying activities

Location 3

The last and smallest selected area encloses the Science and Activity Building space (Figure 18). This area, connecting the main campus buildings, is the location where students take the bus to the dorms. Several students move across this area to go to class and/or to go the bus stop.

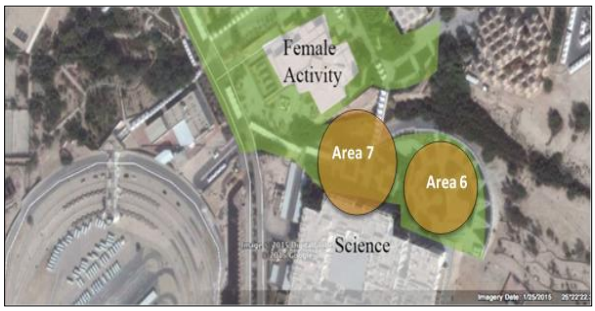

Figure 18. Location 3 Map

Efficient and adequate sun-shading devices and seating benches are lacking and required within this space, to accommodate a large number of students transiting and/or stopping by in this area. Several students stressed that this area is severely exposed to the sun, with no shading protection, which makes the area uncomfortable and reduces its livability (Figure 19 and Figure 20). The provided shading devices only cover the walking areas connecting the buildings as a passage way (Figure 21 and Figure 22).

Figure 19. Exposed Walkway of the Women's Engineering Building

Figure 20. Exposed Walkway of the Women's Engineering Building

Figure 21. Exposed Plaza in front of Female Engineering Building

Figure 22. Shading devices for walkway to the Sharia Parking

Therefore, in order to create a livable/comfortable space where students can stop by and sit, the sun shading devices distribution must be implemented, since the current shading one provide only protection towards the direct overhead sun. Natural shading elements such as tress, offering protection along the day, would be preferable in this area and contribute to enhancing the livability of the area. Adding natural watering elements, such as fountains, would also encourage students to utilize the area: fountain would reduce the temperature, creating a more desirable micro climate.

Seating areas in this space should also be created, seen the number of students transiting within this area. The lack of seating benches in this area forces students to stand most of the time or to seek shelter within indoor areas of adjacent buildings. Most of the existing seating benches are unshaded and built of the cast in place concrete, scattered around the area and therefore not contributing to the creation of a vital social realm where students might sit and converse with each other. Additional refreshment services and/or kiosk/cafes serving coffee, cold drinks, and snacks would further contribute to revitalizing the area, enhance its livability and/or encourage students to perform social activities in the outdoor area (Figure 23 and Figure 24).

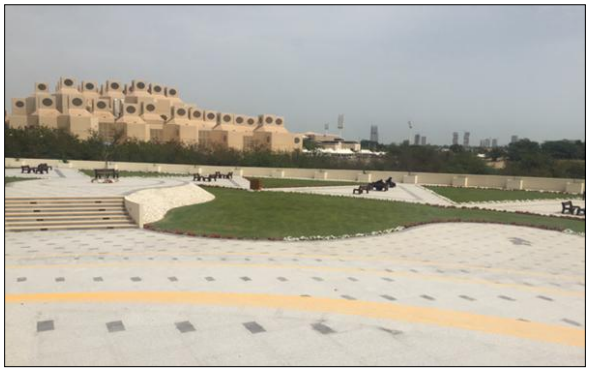

Figure 23. Proposed Plaza before Architectural Design intervention

Figure 24. Proposed design features in the plaza after Architectural Design intervention

4. Conclusions

Qatar University campus has evolved in the past decades. The campus, designed with a peculiar overriding building style, has acquired its own identity and character: the campus is the National ‘academic crossroads’ where students from different multi-disciplinary schools meet and share views. Its character is set by the density, proportion, materials, the traditional appearance of its buildings and interconnecting open spaces.

This paper discusses how to implement the campus’s physical setting of Qatar University in order to enhance livability. It explores the perception of students of the spatial form of the campus, highlighting the extent to which open areas between various buildings should be revitalized and/or implemented. The findings revealed in this study highlight the importance of actively involving students into the design of the campus: their think about should therefore be integrated into the campus design process and contribute to set guiding principles and recommendations for future development. Namely, within the analyzed areas, students highlighted the criteria with which to define a strategy for the implementation of the selected areas and/or for creating livable public-open environments. Namely, students participating in the survey stressed that an addition of sun-shading devices, seating benches, trees and green areas,

water features and kiosks/cafes would severely contribute to enhancing livability, to encourage students' social activities and to create vibrant recreational spaces, which are currently under-utilized or mainly utilized as transiting pathways, due to their low level of livability.

Also, buildings and surrounding revitalized open areas can contribute to creating an environment enhancing intellectual and social exchange among diverse people, belonging to different backgrounds and culture. It is the physical character and quality of the campus, defined by both its facilities and its open spaces, which have the potential for enhancing livability within the shared space of the campus. The sense of community can be promoted through the actively shared open spaces, the shaded walkways, green areas, courtyards and plazas, which can facilitate the enriching experience of both planned and accidental gathering. These public outdoor spaces should be designed with the purpose to enhance social and intellectual exchange, through casual encountering and conversation.

In addition and significantly, the strategy for implementation of the outdoor areas and/or for enhancing livability within the campus should respect the traditional culture, which has to be maintained. In Qatar the culture understands privacy and segregation between males and females within public spaces. Privacy and/or segregation are principles which have been highly considered along with the design of Qatar University campus. Segregation between male and female has been around since the pre-Islamic era and is deeply rooted in Arabic and Islamic traditions. This ideal is held by both the students attending Qatar University and also by their families visiting the campus.

The Qatari community tends to adhere to their traditional and cultural values, embedded in the way of life and/or culture. Therefore, the segregation between males and females represents a crucial aspect of public Qatari life and is visible within the community. The requirement of segregation within the campus contributes to the formation of a safe environment, where families feel comfortable and safe with the environment where their siblings spend years of their life to pursue an education. Also, as stated, students themselves belonging to an Islamic culture feel more comfortable when a cultural principle such as privacy and segregation is maintained within the physical environment. A physical environment where such cultural principle is maintained is preferred to environments where this principle is neglected. Therefore, the physical embedment of segregation is appraised by the student-community.

This principle is deeply embedded within the past and current Qatari way of life and culture. The 2030 Qatari National Vision stresses this aspect under the term 'Modernization and Preservation of Traditions', highlighting the need for modernization while maintaining a cultural identity, which belongs to a community. Namely, QNV-2030 states that 'Preservation of cultural traditions is a major challenge that confronts many societies in a rapidly globalizing and increasingly interconnected world. Qatar's very rapid economic and population growth have created intense strains between the old and new in almost every aspect of life. Modern work patterns and pressures of competitiveness sometimes clash with traditional relationships based on trust and personal ties and create strains for family life. Moreover, the greater freedoms and wider choices that accompany economic and social progress pose a challenge to deep-rooted social values highly cherished by society' (Planning, 2008). This represents a challenge not just to the State of Qatar, but around the GCC and Arab countries.

In the past two decades, university campuses in the Middle East were designed to create a contemporary work of architecture, which would resonate with the global scientific community while being firmly rooted in the local Arabian culture. For example, Qatar Foundation campus is one of the prime and leading institutions of the State, which is primarily focusing on the founding vision of Her Excellency Mozah bint Nasser Al Missned, who specified education and human development as a pillar of their country's vision with a goal of building a bridge between the present and the future. Traditional elements have merged with modern design to create a unique architectural concept. The campus provides a welcoming and comfortable environment that is conducive to study, learning, and communication and delivers an exterior and interior design that is memorable and worthy of the institution. Respecting the cultural and traditional values, male and female students have separate cafeterias, student lounges and recreational areas with swimming pools. The building design aims to inspire and encourage both the students and the local community to appreciate the innovative and pioneering design solutions that reinforce their enthusiasm for a sustainable development of Doha. The design approach in the institutions often enables the building to act as a learning resource in its own right, embracing the College students' enthusiasm for protecting their environment. The complex design incorporates local culture, which is mixed with modern technology to create a unique, world-class facility for the students of Education City. Aiming at preserving the cultural and traditional principles embedded into the Islamic city, buildings are joined by streets to the main plaza.

Another institution promoting values based on traditions within its campus is the internationally acclaimed 'King Abdullah University of Science and Technology' (KAUST) located in Ryad, the capital city of Saudi Arabia. The goal of the design of the campus was to respond to extremely hot arid climate, seeking inspiration from the traditional architecture of Middle Eastern regional context. Features that aid in the campus planning include the compactness of the buildings: this feature embedded into the traditional Arab city, where buildings are closely spaced, helps minimize the areas of the building façade that is exposed to the direct sunlight, thereby bringing in the cool breeze and naturally ventilating the spaces in-between. This feature also helps to temper the extreme micro-climate, which along with the outdoor walking is critical to foster outdoor activities and interactions. Another feature, often visible in Middle Eastern

university campuses is the use of the traditional wind towers, which is one of the older passive ventilation strategies encouraging air flow into the pedestrian walkway. Courtyards connecting buildings often act as interactive and collaborative spaces. Mashrabiya helps to filter the light and create beautiful light and shade patterns. In conclusion, public open spaces among buildings at the Qatar University campus should be providing a livable and productive learning setting, which also contributes to establishing a strong bond between the user and the physical environment. The respect of cultural values, which influence the way of life and/or culture, contribute to significantly implement livability of the physical setting and namely to the enhancement of the users' feeling of comfortability. This key-aspect should not be neglected.

5. Future Research Opportunities

This current study was limited to an exploration of the link between the spatial configuration of specific and/or bounded public open spaces within Qatar University's campus and students' social interactions, in order to understand to which extent the physical setting of specific open spaces can be implemented and, therefore, contribute to enhancing social interactions among students. In addition to the limitation represented by a specified physical setting, the selected case study was also bounded by a limited number of students to be consulted. This suggests that the findings obtained through this exploration are related to a case study selected by restricted and manageable limits.

Therefore, based on the findings revealed through this research study and on the limitations listed above, further studies investigating various public areas within the campus of Qatar University, and/or the physical setting of various campuses located in the Middle East, could be engaged to provide a deeper understanding of the sociological interconnections between space and social interactions, possible specific traits of socio-cultural factors and perspectives on gender in Islamic countries. In turn, this would contribute to shaping a comprehensive framework for the future development or implementation of the urban setting of Universities' campuses in GCC.

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