International Journal of Architectural Research

Archnet- IJAR

ArchNet International Journal of Architectural Research – Archnet-IJAR is the first of its kind; an interdisciplinary comprehensive scholarly journal of architecture, planning, and built environment studies, that is blind reviewed and published on the World Wide Web three times a year.

Objectives
Archnet-IJAR objective is to establish a bridge between theory and practice in the fields of architectural and design research, and urban planning and built environment studies. It reports on the latest research findings and innovative approaches for creating responsive environments, with special focus on architecture and planning in developing countries.

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Comportments, Lausanne, Switzerland, pp. 93-100.


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MYTHIC FOUNDATIONS: ENGAGING HISTORY FOR ARCHITECTURE EDUCATION

Tammy Gaber

Abstract
The construction of physical models in design studios and workshops is a time-honored tradition in many schools of architecture. The construction of models in history of architecture courses allows for multiple lessons of ordinance, structure and surface elaboration. These lessons become palpably understood by the students through their study and reproduction of orthographic documentation, as well as the translation to construct with contemporary media and mechanisms. This paper highlights the results of a cultural history course in architecture, recently taught, where the students collaborated in groups to construct 1:100 models of the major temples of worship in Medieval Europe. The processes involved and the results documented were indicative of this promising avenue of exploration.

Keywords
Architecture education, cultural history, physical models, temples.

Introduction
The study of history in architecture schools involves much more than understanding the physical qualities of extant or well-known edifices. In some schools of architecture, history courses involve the cross-disciplinary study of contemporaneous literature, pictorial and sculptural arts in addition to studies of the prevalent culture, economics, geography and politics of the time. The extant buildings were most often the grand places of worship that survived the erosion of development and demonstrated many of the predominant and contextual forces of the time. As well, these temples were often encapsulations of mankind’s greatest explorations of building technologies. Communities and governments poured their resources, efforts and latest knowledge of technological exploration into their local temples – places worthy of their divine. This can be seen in the many Gothic cathedrals of medieval Europe, the intricate elaborations of Umayyad mosques and the proportioned sobriety of Renaissance churches to name but a few.

How does this relate to contemporary technology? Why study these ancient temples today?

The author has taught history of architecture
courses for over a decade and recently taught the Foundations of Europe course to second year architecture students at the University of Waterloo’s School of Architecture in Canada. The study of the Foundations of Europe involved the understanding of the complex ordering of people, beliefs, space and worship from the fall of the Roman Empire to the beginnings of the European Renaissance. The variety and the plurality of this era of study required that one look at the different forces that shaped the products of literature, sculpture, painting and sacred spaces that remained. As such, the course included a critical reading of eleven primary and secondary texts written during or about the specific aspects of the era, as well as analysis of eleven films that elaborated upon specific or overarching themes in the course.

The main project for the course was the construction of 1:100 physical models, by students in groups of five or six, of the major temples of medieval Europe and the adjacent region: synagogues, churches and mosques. Students were free to use a variety of materials and were free regarding level of detail and employment of technology in their construction. This paper outlines role of this project within the course and focuses on the processes involved creating these models that allowed the students to assimilate and understand the architectural concepts of ordinance, structure and surface elaboration.

**Beginning: Framing Lessons of the Past**

History courses in schools of architecture are windows into the past, an opportunity to understand the connection between non-physical factors to physical construction. The Foundations of Europe course taught by the author is one such example. However, history is often not clear, linear or straightforward. Prevalent studies – and education- of medieval European architecture often focused on the linear progression of Early Christian, Byzantine, Romanesque, Gothic which lead up to the Renaissance. Works as early as Viollet-le-Duc’s Dictionary of French Architecture from 11th to 16th Century originally published in the mid 19th century (Viollet-le-Duc, E., 1875) to Sir Banister Fletcher’s A History of Architecture on the Comparative Method first published at the end of the nineteenth century and later republished twenty times, both evidence a certain perpetuation of a particular, and linear, reading of architectural history (Cruickshank, D., 1996). When studied in this compartmentalized manner, a roster of building elements and technologies can be neatly lined up. However, there are many other approaches taken in contemporary texts on the history of architecture, including phenomenological and hermeneutical readings of space (Barrie, 2010; Jones, 2000) which evaluate historical spaces in more complex terms of user experience and cultural context.

In addition to this, it is important to note that particular ‘eras’ were not recognized as such during their time and were labeled afterwards by historians. The Florentine artist, architect and historiographer Giorgio Vasari in his sixteenth century publication, Lives of the Artists; biographies of the most eminent architects, painters and Sculptors of Italy (Vasari, 1946) in his glorification of his era was the first to use the term ‘Renaissance’. As well, Vasari was the first to use the term ‘Gothic’ to
refer to the era directly proceeding his, “Then arose new architects who after the manner of their barbarous nations erected buildings in that style which we call Gothic (dei Gotthi)” (Vasari, 1946). The different ‘eras’ of medieval Europe overlapped and development was not at all linear or simultaneous throughout the continent and region. In addition to this, exterior forces including trade with the Orient and the Crusades dramatically influenced European culture and architecture. As well, the presence of Islamic rule in Southern Italy for nearly two centuries and in Spain for over seven centuries resulted in an amplification of cross-cultural influence within and beyond the geographical constructs of the European continent (Belting, 2011; Essa & Ali, 2010; Maalouf, 1984).

As such, the study of European medieval history requires a nuanced and pluralistic approach to understand the development and expression of building technologies that remain for us today. Although commonalities may be found in any one of the designated periods of medieval history, differences abound and often each building is singular in a particular exploration of design. This may explain how the act of construction of each of the temples was viewed at the time as a great act of worship.

By looking pluralistically, and to some degree circuitously, layered meanings and development can be revealed. For example, included in the reading list for the course were the writings of two twelfth century chroniclers: Abbot Suger and Ibn Jubayr. Suger’s was an in depth description of his beloved Abbey St. Denis, regarding the architectural renovations and additions that were carried out as well as a description of the collection of relics and lavish artistic treasury (Panofsky, 1979). Suger himself played an important role in the politics of the time, acting as regent for the King for two years during the second crusade. Nearly contemporaneous, the Andalusian traveler and geographer Ibn Jubayr wrote of the courts, temples and practices in areas of southern Europe and the Levant he was able to visit (Broadhurst, 2003). Much more than description, in these chronicles demonstrates critical analysis of the numerous cultures, including the effects of the rule of Saladin and the recent Norman-post-Arab court of Sicily. Both Suger and Ibn Jubayr left behind written legacies however, the disparity of belief, intention and most importantly the great differences of the documentation of the spaces and temples of Europe demonstrated that Medieval Europe was a complex era beyond characterization of particular labels such as ‘Romanesque’ or ‘Gothic’ but was immensely pluralistic.

Using these descriptions and others, a more nuanced reading of the role and relationships of architecture to the prevalent cultures were discussed in the course. For students of architecture, the qualities of space and elements of construction were evaluated and used as an entry portal to grasp concepts of design and simultaneity. Reading about each era from primary and secondary texts importantly served to contextualize and understand the non-physical forces of the time. However, in order to understand the concrete forms of the spaces simply viewing images, in texts or projected in a lecture hall, can be no substitute for physically engaging the spaces. One approach to palpably understand historical spaces was through the construction of large scaled models.
Middle: Present Explorations

The importance of manual model making in the development of visual and spatial cognitive skills in design was, and in places, still is a cornerstone of architectural education, as exemplified by Rowena Reed Kostello’s lifelong commitment to design education (Hannah, 2002). Within the context of a cultural history course, manual model making immediately brings the spaces of the past into the present tense: the immediacy of grasping building systems, logic and techniques comes into direct contact with the students existing understanding of contemporary systems, logic and techniques.

Students engaged and re-imagined the assembly of great monuments of history. In addition to this, model making today is not what it was twenty or even ten years ago. Students had at their disposal not only a greater variety of materials but also a increased diversity of construction technologies – from simple knife cutting and hand held tools to mechanical equipment (for cutting, boring, sanding, shaping, surfacing) to laser cutting and Computer Numerical Control (CNC) routers to state-of-the-art 3D printing. However, of these technologies varied in cost and efficiency in time and the students learned to combine the ‘low’ technologies of hand held tools and mechanical equipment with ‘high’ technologies of laser cutting, CNC routing and 3D printing. In all of the models, the students learned the processes of pattern making, assembly line and mass production of similar elements such as columns, arches,

Figure 1: CAD work, Laser-cut panels prepared and assembly of elements in Great mosque of Damascus model (Source: Amr elBahrawy)
buttresses and so forth (see Figure 1 and 2). These applications were understood to some degree to parallel ‘real world’ construction, both ancient and contemporary.

In the process of making the physical model, it was necessary for students to engage three levels of building construction: ordinance, structure and surface elaboration. In each level, the ‘past’ came to terms with the ‘present’ through the rendition of materials, building technology and systematic approach.

**Ordinance**

The meaning and usage of the word ‘ordinance’ varies from profession to profession, however, when applied to architecture it may generally refer to the building organization in terms of module but also has deeper meanings, especially with the construction of temples. The organization of a building may relate to a repetition of a measuring unit or a rhythmical patterning of proportion and may also refer to pre-determined religious rites, pre-existing sacred elements or other factors that rendered the plan with an organization that was not necessarily continuous or orthogonal. When students became involved deeply in these rich variances, layers and possibilities in ordinance, the depth of architectural space as a narrative emerged. This was demonstrated in the study of the irregular plans resultant of pre-existing sacred buildings or elements and because of development of rituals found in Early Christian and in Umayyad architecture.
Rhythmical and proportioned plans were found in many Byzantine churches that were tied in heavily with new complexities of roof structure and in Romanesque and Gothic works, the rhythmical and proportioned plans related to the vertical structural elements. In addition to this, some of the temples studied and constructed were themselves palimpsests of layers of different religious orders such as the Basilica San Clemente, the Great Mosque of Damascus and the Mosque/Cathedral of Cordoba. Other groups had to grapple with the complexity of growth which related little to any kind of immediate ordinance such as the complex of the Monastery of St. Catherine’s with its agglomeration of forms and buildings (see Figure 3).

Figure 3: St. Catherine’s monastery model demonstrating agglomeration of buildings and forms in the complex. (Source: Richard Philip D’Alessandro).
Translations of this ordinance into physical model making required the students to comprehend the deeper layers of organization than what might normally be afforded by contemporary design. Students most often had to redraw the plans and sections based on partial or fragmentary documentation. The most efficient method to do this was to digitally scan (or import) existing drawings of plans and sections found in history texts and relevant sources into a Computer Aided Design (CAD) program where there students were able to ‘clean’ up the image, identify and apply scale and designate dimensions for every element for subsequent construction.

**Structure**

Following the establishment of ordinance and complete CAD documentation of orthogonal projections of each building, the physicality of the structure needed to be addressed. Using the plan and section drawings, digitized on a CAD program, students began to comprehend and detail the thicknesses and materials used in the original building. The appropriate choice of model materials to reflect the actual materials of their monumental case study was another exercise in past-meets-present translation. The complete model needed to express qualities of mass, void and structure in a convincing manner – such as demonstrating the difference between timber, stone and masonry. Groups such as the one working on the model of Basilica of San Clemente, chose to use a different colored cardboard for each historical layer of construction of the building. Thus, the sectional hinge of the model revealed three strata including the Mithraeum, the first to fourth century church and the 12th century church structures that was clearly discerned in this subtle manner. As well, the group that worked on the model of the Worm’s synagogue (see Figure 4), chose to use a variety of dark woods to represent the thick masonry walls and the sectional hinge not only revealed the space below ground of the purification bath, the mikveh, but also aptly demonstrated two different historical orderings of the main interior space.

![Figure 4: Worms Synagogue model, opened section-ally to demonstrate underground ritual bathing area, mikveh, and two different interiors historically attributed to the space during different eras. (Source: Amr elBahrawy).](image)
it was necessary to engage historic concepts and technologies and render them with contemporary approaches. The making of the model became much more than the mere representation of a magnificent building but induced the students to design a system of contemporary construction and assembly that was effective with respect to materials and technology used. Students necessarily learned to understand how the particular, and sometimes complex, structural system of their case study building ‘worked’ as often this was alien to the students’ existing vocabulary.

Structural systems such as the domes on squinches found in Byzantine architecture, or complex vaulting and buttressing in Gothic architecture or complex tiers of multi-lobed arches found in some Umayyad architecture in Spain all brought to life – and to the present – the ancient innovations in structure in a palpable manner. The group that worked on the Byzantine church of Haga Sophia resolved the placement of the large dome on pendentives using a combination of materials (see Figure 5), as did the group which worked on the smaller Byzantine church of S.Vitale (see Figure 6) which contained the dome on squinches. The group that worked on the model of the Beauvais cathedral struggled with the presentation of the

Figure 5: Dome of the Haiga Sophia constructed using a 3D printer.
(Source: Richard Philip D’Alessandro).
massive buttresses and opted to use plywood to achieve the thickness of the elements (see Figure 7). The models of the Mosque/Cathedral of Cordoba and the Great Mosque of Damascus used a combination of thin wooden dowels for the columns and laser cut cardboard to create the rows and tiers of arches (see Figure 8 and 9).
With the use of comprehensive CAD programs, students moved freely within their digitized building to determine the best location for their sectional hinge and importantly, converted the drawings into physical form. The CAD drawings produced of the assorted building elements were also used to program and cut the model version of the elements on a CNC router or on the laser cutting machines. As well, the CAD drawings of the elements, for some groups, were exported to different formats and used in Computer Aided Manufacture (CAM) programs that programmed the 3D cutting on the CNC router or for 3D printing. Laser cutters and CNC routers precisely cut embossed or created reliefs on various materials according

Figure 10: Intricate Gothic tracery of tower created by assemblage of laser-cut millboard pieces for the model of Friburg Minster cathedral. (Source: Richard Philip D’Alessandro).
to the CAD drawings. This was extremely effective for intricate tracery, such as the rose windows and spire so delicately carved in cardboard using laser cuts in the model of the Gothic cathedral of Freiburg Minster (see Figure 10). The most advanced technology available in the workshop, 3D printing, was sparingly used due to the limitations in size, the constraints of high costs and the need for a complete and detailed 3D CAD documentation. The group that constructed the model of Haga Sophia used 3D printing to represent the difficult dome form in four precise sections.

**Surface Elaboration**

Finally, through model making, the students explored an area of architecture that is minimally addressed in contemporary buildings: surface elaboration. With the great temples of medieval Europe it would be an incomplete effort should the models have remained smooth-surfaced volumetric representations. The different case study temples demonstrated diverse approaches to surface ornamentation, from rhythmical repetition of iconographic and vegetal mosaics, to precisely calculate geometric and arabesques made of marble or tiles to carve architectural. Several projects included hand-painted interior detailing such as the painted mosaic patterns on the interior of S.Vitale (see Figure 11) and the painted panels in the Basilica of S.Clemente (see Figure 12). In the model of Kings College Chapel, the group reproduced each of the individual stained glass windows by color printing, to scale, on plastic and framing the interior and exterior with laser cut cardboard tracery (see Figure 13 and 14). The group that worked on the Aqsa mosque employed laser cutting on cardboard differently, with assorted depths used to delicately carve surface reliefs in some areas and in other areas the laser cutting was employed to carve out intricate tracery of the windows within the mosque space (see Figure 15).

Ornamentation was not simply used to aesthetically enhance the edifices and through the process of creating their models, the students recognized that like ordinance and structure, there was a system of design that may not necessarily be entirely understood upon first glance. By ‘mapping’ the iconography on the surfaces of the temple, students found patterns of dogmatic organization, relations to pre-existing buildings on the site, and layers of historical modification such as in Early Christian, Byzantine, Judaic and Islamic temples. As well, when studying the surface ornamentation, the students also found that the elaborations were integrated within the structural system as elements of the architecture, such as the carvings in the tympanum, column capitals, sculptures and chimeras found in Romanesque and Gothic churches and cathedrals. To transform and grasp the system of iconography in the temple the students used CAD programs and scanned images that were immediately mapped out with relation to scaled assignments of the various elements. For example, the digitization of a wall mosaic at a Byzantine temple efficiently described the size and proportion of various iconic motifs. With the digital rendition students were able to decide upon efficient, and contemporary, methods to reflect this elaboration on their model through scaled reproductions.
Figure 11: Detail of S.Vitale model demonstrating hand-painted interiors representing mosaic iconography and surface finishes. (Source: Amr elBahrawy).

Figure 12: Interior view of San Clemente model demonstrating surface elaboration using hand-painted and laser-cut elements. (Source: Richard Philip D’Alessandro).

Figure 13: Model of King’s College chapel as viewed from interior demonstrating fanned vaults, stained glass windows and interior detailing. (Source: Richard Philip D’Alessandro).

Figure 14: Detail of stain glass windows, buttresses and tracery in Kings College Chapel model as viewed from exterior. (Source: Richard Philip D’Alessandro).
Tangencies

The overall lessons of model making were multiplied within the context of the class where there were numerous models of Medieval European temples being crafted in the studios and workshop facilities of the school. The process of creating the model was as much a lesson in design and building technologies as the final product was of understanding historical spaces. Physical experimentation and manipulation were essential for the creation of the models, and this required the engagement of the sense of touch, that is often lost in the
vision-dominance of contemporary practice as described aptly by Juhani Pallasmaa in his text, The Eyes of the Skin, Architecture and the Senses (2005). Simply looking at images or drawings of these buildings did not allow for the same depth of understanding as making them – the recognition, memory and ultimately the synthesis of the multiple lessons of order, form and elaboration became engrained. With this immersion in construction and space making, the students utilized various forms of technology including digital and mechanical and took away with them an extended vocabulary of the assembly of elements along the lines of Christopher Alexander’s Pattern Thinking (1977). Abstract ideas discussed in these important contemporary texts were understood implicitly through this process of making.

**Future: Lessons of the Physical and the Virtual**

A question might arise, ‘Why not just make virtual models of the historical buildings?’ Although this is an exciting avenue of exploration, especially with some contemporary virtual reality and holographic architectural modeling programs, however, for a course of this nature in a school of architecture, students needed an engagement of historical and contemporary technology that went further with physical rendition. The construction of models at a scale of 1:100, were large enough to physically demonstrate the qualities of the spaces in comparison and to understand differences in dimension which is not easily done in the ‘zoom in’, ‘zoom out’ digital world. In addition to this, students when making physical models moved back and forth between their own digital and mechanical technologies and found systems of creation that were akin to the ‘real world’ of the past and the ‘real world’ of today’s model building with respect to ordinance, structure and surface ornamentation.

The outstanding work done by the entire class must be credited to their dedication and intensity of effort. All of the models were completed in very limited time, ranging from two to four weeks, while the students were fulfilling other demanding course work including design studio. The actual temples studied varied from intimate in scale to monumental, thus the 1:100 models ranged in size from having a base of 40 cm2 to bases over 1.5 m2 – accordingly the amount of time dedicated to construction and to embellishment differed greatly. With smaller models, more time was given to craftsmanship, such as the Worms synagogue, and to surface elaboration such as S.Clemente and S.Vitale with their hand-painted interiors. However, the largest models demanded that more time was spent on construction of the massive elements, such as with Haiga Sophia or Beauvais Cathedral (see Figure 16) or time was spent constructing and assembling hundreds of smaller elements such as with the Mosque/Cathedral of Cordoba and the Great mosque of Damascus. The model was weighted at 30% of the course grade and the subsequent essay written on the same subject was weighted at 20%. Reflecting on the successful results of the students and considering the hefty demand of the workload for this particular assignment, more time was needed, possibly with segmented deadlines and a larger weight assigned to the grades.

The models were displayed, until the remainder of the term, in the atrium of the school of
architecture. The attention and well deserved admiration of the school’s staff and student body allowed for an even larger pedagogic experience and relation of spaces. Many of the models were exhibited in the Cambridge city hall for a short duration and now many of them are on permanent display in the University of Waterloo Musagetes Architecture Library (see Figure 17 and 18). Visitors to the school, especially on open days for potential incoming students and for employers coming in to interview and hire students for their co-operative work placements also recognized the achievement of the students both in craftsmanship and creatively in depicting certain aspects of the building on each side of the hinge.

This specific experience, and previous similar experiences of teaching history in architecture
schools, highlights the opportunity to move between the ‘virtual’ qualities of both text and technology and the physical qualities of buildings and models. This movement between virtual and physical provided a multitude of lessons in theory, design and technology. Differences of time, place, resources and aspirations nuanced this understanding. Beyond this, there were opportunities to empower students with an expanded vocabulary of volumes, structural systems and surface elaboration that were rendered to contemporary technology by way of the students’ construction of the models. Further translation to contemporary technology was demonstrated with the application of digital media such as CAD, 3D or rendering programs. This process allowed students to intensely engage the history of this period so that the mythic foundations of history began to unravel and layers of meaning and order were revealed.

References


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All photographs taken by the course Teaching Assistants: Amr elBahrawy and Richard Philip D’Alessandro.
Architectural Criticism in Practice: From Affective to Effective Experience

Aaron T. Davis and Wolfgang F.E. Preiser

Abstract

“Although many artists and architects privilege phenomenological experience, they often offer the near-reverse: ‘experience’ handed back to us as ‘atmosphere’ or ‘affect’ - that is as environments that confuse the actual with the virtual, or feelings that are hardly our own yet interpolate us nonetheless. In the guise of our activation, some work even tends to subdue us, for the more it opts for special effects, the less it engages us as active viewers.” (Foster, 2011)

The article that follows chronicles the evolution of the respective sub-fields of endeavor from the unique perspectives of the authors and their cumulative involvements and experiences. Its main purpose is to begin to bridge the gap between the affective and effective goals of architectural criticism (Attoe, 1989). In other words, the attempt will be made to connect the perceived vs. measured quality of the designed and built environment, including visual-aesthetic quality. The result is an entirely new form of criticism that is instructive as both a tool to professionals and an explication of the built environment to the layperson beyond aesthetic platitudes. Because of its cumulative nature, the 2-part literature review is not intended to be exhaustive since that can be gleaned from a sample of authoritative publications on the evolution of: 1. Architectural Criticism: On Architecture: Collected Reflections on a Century of Change by Huxtable (Walker, 2010), Why Architecture Matters by Goldberger (Yale University Press, 2003), and After the End of Art: Contemporary Art and the Pale of History by Danto (Princeton University Press, 1997); 2. Post-Occupancy Evaluation/Building Performance Evaluation: Enhancing Building Performance by Mallory-Hill, Preiser and Watson (Wiley, 2012); Learning From Our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation by Federal Facilities Council (National Academy Press, 2001); and, Building Evaluation Techniques by Baird et al. (McGraw-Hill, 1996).

Keywords

Architectural criticism, architectural practice, architectural education, post occupancy evaluation, building performance evaluation.

Introduction

By exploring 3 theses this review will demonstrate the need to substantially expand the traditional definition and role of architectural criticism:

Thesis 1: Architectural criticism in its present form is limited to visual/aesthetic concerns, such as form, composition, order, etc., but typically does not cover the addressing of needs for major stakeholders in buildings (such as occupants,
owners, facility managers, and visitors). Furthermore, it treats as taboo the factors contributing to a project’s realization and/or subsequent social, technological, or spatial effects. These effects and concerns center on the 3 major levels of habitability: 1. Health, safety and security; function, efficiency and workflow; and social, psychological and cultural performance/satisfaction. Originally, Vitruvius (1960, translated by Morgan) poses firmness, commodity and delight to be preconditions for a successful work of architecture that are not mutually exclusive, but integral. Even now, in a contemporary context, we find the most productive projects as those whose effort is towards understandable qualities of space, not a spectacular mediated experience posing as meaning (2011, Foster).

Thesis 2: A second thesis to be elucidated is the fact that architects and major stakeholders in buildings often do not see eye to eye because of divergent and rarely discussed value systems, degree of expertise, and positions versus the designed and built environment. According to the Habitability Framework (Preiser, 1983) the above third category on aesthetic quality evaluation research is subsumed as part of the social, psychological and cultural performance/satisfaction in building user feedback. For details see Post-Occupancy Evaluation by Preiser, Rabinowitz and White (1988).

Thesis 3: For architectural criticism to be valid and comprehensive, the subjective or perceived criteria for criticism and the objective or measured criteria need to be brought together in a single coherent conceptual framework that can be communicated to others. To accomplish this, the authors propose evaluation scales featuring weighted scores for all performance aspects of the built environment that are considered to be important, including visual aesthetic quality. For a precedent see Preiser and Wang (2012) and Heerwagen (2001).

The outcome of this endeavor will be a comprehensive and future-oriented conceptualization of architectural criticism in practice.

In the following, the evolution of three major components of this project is chronicled: 1. Architectural Criticism, from traditional humanist critique to aesthetics-centered and finally, reactionary criticism. 2. Post-occupation/building performance evaluation. Major concepts and components in post-occupancy evaluations are highlighted, and examples of outcomes presented. This consumer-oriented approach is part of a new democratic paradigm embodying autonomy, self-organization, ecology, sustainability, adaptation, and continuous improvement. Questions about the future of this field are raised, including its viability and benefits for all major stakeholders in buildings.

**Traditional Architectural Criticism:**
**Literature Review of Past and Present Trends**

**The Evolution of Architectural Criticism:**
**Moralism**

In 1875, Denis Diderot established himself amongst the French elite as an aesthetic and substantial critic of the Salon and its social implications. Diderot’s criticism was based primarily in an ekphrasistic method amounting to nothing more than a detailed description of the actual picture as-such, neglecting the position of the work in any sort of canon or
historical arc that would lend it greater populist significance. The description of the picture itself was a subjective reading of the work through which Diderot was able to project and instruct a variety or moralist points of view, imbuing the artwork with content greater or different than the intent of the artist (Diderot, 1765).

The Evolution of Architectural Criticism: Humanism
The work of Lewis Mumford, an unabashed humanist and critic of modern life, necessarily discussed the role of architecture and urbanism in that life. Amongst his oeuvre are numerous accounts and critiques of the City and its inhabitants that found a resonance in the pages of The New Yorker, Architectural Record, and Architecture magazines. What distinguishes his work at The New Yorker is that it is presented in a forum non-specific to the disciplines themselves. In other words, the existence of the architecture and urbanism discussion outside of a devoted periodical gave access to a general public that otherwise might not have had it. By the late 1950’s, Mumford’s work opened the possibility that the city and its buildings could be legible, and that the common man could learn to read it and develop opinions, tastes, and convictions around them.

“If we are to create balanced human beings, capable of entering into world-wide cooperation with all other men of good will--and that is the supreme task of our generation, and the foundation of all its other potential achievements--we must give as much weight to the arousal of the emotions and to the expression of moral and esthetic values as we now give to science, to invention, to practical organization. One without the other is impotent. And values do not come ready-made: they are achieved by a resolute attempt to square the facts of one’s own experience with the historic patterns formed in the past by those who devoted their whole lives to achieving and expressing values. If we are to express the love in our own hearts, we must also understand what love meant to Socrates and Saint Francis, to Dante and Shakespeare, to Emily Dickinson and Christina Rossetti, to the explorer Shackleton and to the intrepid physicians who deliberately exposed themselves to yellow fever. These historic manifestations of love are not recorded in the day’s newspaper or the current radio program: they are hidden to people who possess only fashionable minds. Virtue is not a chemical product, as Taine once described it: it is a historic product, like language and literature; and this means that if we cease to care about it, cease to cultivate it, cease to transmit its funded values, a large part of it will become meaningless, like a dead language to which we have lost the key. That, I submit, is what has happened in our own lifetime” (Mumford, 1938).

Therefore, it is with little surprise that Architectural criticism as a public endeavor was formalized in the early 1960’s with the appointment of Ada Louise Huxtable as the critic at the New York Times. “The Critic has to stand between the Artist and the User and be objective and fair,” Huxtable states in an interview. This extension of Mumford’s humanism is tempered by the inclusion of art-historical references proliferating during this period in which the modern conception of perception was theorized and explored in the visual and spatial arts (Sartre, 1956; Greenberg, 1961; Merleau-Ponty, 1964; Rosenberg, 1964; Sontag, 1966; Judd, 1965, et al.).

Modern art and aesthetic criticism rejected the idea of the ekphrasistic narratives entirely,
preferring (out of necessity) to provide strict formal analyses in the absence of a recognizable subject. As the formal analyses evolved, and multiple works by the same artist were examined, a language of iconography and style entered into the discussion, which elevated (or reduced) the role of artistic criticism to a market force driven by opinion and class rather than an analytical tool.

As the discussion of art from a critical standpoint started to branch out from the picture plane, it conjectured that the presence of art as a physical object actually had the ability to create space. Once this barrier of perception was crossed into the realm of inhabitation, position, and movement the analysis of art and its history lent itself as a foundation for the critique of modern architecture.

Huxtable’s situating insight that challenges the Times reader while providing an historical and technological context that educates, allowing the reader to understand why a work deserves critique, and by extension, their attention.

Following Huxtable, Paul Goldberger assumed the role of critic at the Times, reminding the readership that in light of the establishing of bubble economies, technological innovation, and sound bite punditry at all levels of popular culture, architecture cannot, and should not, be reduced to an image.

“But of course no building can be viewed solely through the lens of aesthetics anyway, or at least it should not. Architecture criticism is aesthetics and it is politics and it is sociology and it is culture, and if you do not accept the notion that all of these things are intimately intertwined, then you fail to understand what has to be the foundation of all writing about design, which is that every object has an aesthetic presence and a social one at the same time, or, to put it another way, every object is both a physical thing and a political thing, and it has to be understood and criticized as both. It is not one or the other, but both, all the time.” (Goldberger, 2003)

The Evolution of Architectural Criticism: Populism
Goldberger’s departure, viewed in retrospect, provides insight into the nature of evaluative methods for architecture and urbanism during the early 21’s century. His successor, Nicolai Ouroussof, embodies perfectly the blind optimism and self-congratulatory technocracy of the first decade. In place of the education and humanist bent of the earlier critics, we find in Ouroussof an enthusiastic fan of architecture, who has tapped to speak for those he wishes to impress. Much in the same way that the art criticism of Greenberg, Fried, et al. became divisive in the late 60’s because of personal preference and championing of individual artists, Ouroussof has his favorites (or they have him) and is content to provide critique in the same vein as Diderot; the ramifications and position of a work is abandoned for a florid description of the building itself. However, Ouroussof does not exhibit the moralistic or ethical undertones of Diderot. Just as the tough socioeconomic, political, or global implications of a given project are broached, Ourousoff pulls back as if not wanting to embarrass his captive celebrity. On the 2011 opening of CCTV, the massive example par excellence of spectacle architecture:

“After Rem Koolhaas, the project’s architect — along with his former Beijing partner, Ole Scheeren — unveiled the design in 2003 he was
pilloried by Western journalists for glorifying a propaganda organ of the Chinese government. Several years later a fire at the site nearly burned down a neighboring building, also designed by Mr. Koolhaas, landing the director of the project and 19 others in prison for negligence and significantly delaying construction. And then there’s something about the building’s appearance that seems to unsettle people. Just when things got back on track after the fire, a Chinese critic published an article saying that the building’s contorted form, which frames an enormous void at its center, was modeled on a pornographic image of a naked woman on her hands and knees. The piece ignited a storm of negative press, forcing Mr. Koolhaas to issue a denial.

Yet for all that, the CCTV headquarters may be the greatest work of architecture built in this century. Mr. Koolhaas, of the Office for Metropolitan Architecture, has always been interested in making buildings that expose the conflicting energies at work in society, and the CCTV building is the ultimate expression of that aim, beginning with the slippery symbolism of its exterior. At moments monumental and combative, at others strangely elusive, almost retiring, it is one of the most beguiling and powerful works I’ve seen in a lifetime of looking at architecture." (Ourousoff, 2011)

The Evolution of Architectural Criticism: Backlash
Perhaps the most outspoken (if under-appreciated) voice in contemporary architecture criticism is that of historian Hal Foster. Foster, a Ph.D. candidate under Rosalind Krauss at the City University of New York, attempts with his work to bend the arc of history back towards a critical path by pointedly and aggressively dismantling the imagistic culture around us. Framing his work is the belief that the historicist polemic has been rendered impotent by the contemporary preoccupation with spectacle over quality of experience (Hughes, 2002). His most recent work, The Art-Architecture Complex (Verso, 2011), attempts to further explicate the crisis of contemporary perception by examining the work of well-known architects and drawing a distinction between affective and actual experiences. The affective experience, also present in contemporary art practice, short circuits the responsibility of the viewer/user by providing a mediated experience force-fed as meaning. The actual experience comes from the legibility of certain design languages that are present and repeated throughout the works of architects Foster, Piano, Rogers, et all (Verso, 2011) who have come to define the prevailing global “brand” of contemporary modernism.

Post Occupancy Evaluation/Building Performance Evaluation: Literature Review of Past and Present Trends
The Evolution of Post-Occupancy Evaluation (POE)
In the late 60s, evaluation case studies of university dormitories were carried out by Sim van der Ryn (1967) of the University of California, Berkeley, and Victor Hsia (1967) of the University of Utah. While not called post-occupancy evaluations (POEs), these evaluations were the precursors for the first systematic attempts at assessing building performance from the building users’ point of view, for example, one of those early POEs dealt with military postal
facilities, and was commissioned by the AIA Research Corporation (Connell & Ostrander, 1976).

Inspired by van der Ryn and Hsia, one of the authors’ (Preiser, 1969) Master’s thesis also focused on evaluating dormitory performance, i.e., at Virginia Tech it employed political science rating scales (the Thurstone Scale of Equal Appearing Intervals) in innovative ways, which have an error rate of no more than 3% to 5%. These rating scales were used to create quality profiles, as perceived by the students living in three very different types of dormitories. The newest ones looked like high-rise prisons, and the oldest looked like Oxford-style, two-story walk-up structures, and not surprisingly, they scored highest.

By the mid-1970s, the first publications with term “POE” in their title appeared: according to Preiser’s extensive literature searches, the very first one was authored by Herb McLaughlin of KMD Architecture in San Francisco in the AIA Journal issue of January 1975. He and a team of consultants had done POEs on hospitals in Utah and in San Francisco. Over the past 30 years, McLaughlin has been an ardent supporter of POE as a tool for in-house knowledge building in architecture and design firms (McLaughlin, 1997). Then there was the first methodological review of POE techniques that was also commissioned by the AIA Corporation (Connell & Ostrander, 1976). In the 80s, a great number of POEs were carried out in the UK, Canada, New Zealand, Australia, and the US focusing primarily on public works projects, government buildings, airports, and similar facility types.

In the mid-1980s, the National Academy of Sciences (1987) established committees on opportunities for improvement in the practices of programming, post-occupancy evaluation and data base development, which links the two conceptually. What is really interesting to know is: have the recommendations of the reports have come true over the past 35 years? Yes, indeed they have, especially in the information technology arena, which was in its infancy at that time. A seminal and first POE textbook was published by Preiser, Rabinowitz & White (1988). The appendix of that book is perhaps the most interesting part, because it presents measurement techniques for getting feedback on the quality of facilities. Considered to be a companion volume to Post-Occupancy Evaluation, the book Building Evaluation was published a year after it (Preiser, 1989), with case studies from around the world. A more recent case study example of POE evaluations of architecture school facilities utilizing the same methodology was carried out by Nasar, Preiser & Fisher (2007).

The early POE framework (Preiser, Rabinowitz and White, 1988) provided for three levels of effort, degrees of sophistication and data-gathering techniques, cost, manpower, etc.: indicative, investigative and diagnostic POEs. The 3 POE phases with 3 steps each were: (1) Planning: reconnaissance and feasibility, resource planning, research planning; (2) Conducting: initiating on-site data collection process, monitoring and managing data collection procedures, analyzing data; and, (3) Applying: reporting findings, recommending actions, reviewing outcomes. Finally, the three categorizations in carrying out POEs were people (individuals, groups and organizations); scales of settings (rooms, buildings and building
complexes); and, 3 levels of performance (according to the habitability framework). Later on, this framework was considered to be quite simplistic, and, in many ways, inadequate.

**Toward Building Performance Evaluation (BPE)**

In the mid-90s, issues pertaining to the building delivery cycle, as well as the life cycle of a building – a meta level approach to building evaluation, were investigated by Preiser and Schramm (1997), and subsequently, an integrative framework/process model for building performance evaluation was developed. In it, post-occupancy evaluation represents only one of six internal review loops, and the framework focuses on the entire life of a building, as well as the notion of feed-forward into the next building cycle.

The key concept was a gradually evolving knowledge base that is translated into building performance criteria. They cover: issues like health, safety, security; issues addressed by building codes; functionality and guideline materials; and last, but not least, the social, psychological, and cultural aspects of building performance.

**Conclusions**

**The role of evaluations**

Socio-critical, post-occupancy, and aesthetic evaluations have been largely abandoned in recent years in favor of the faux-affirmation of pseudo-scientific data porn and diagrammatic “meaning” writ-large. In the recent past and other times of economic prosperity, little attention is paid (or more tolerance is given) to the production of spectacular artifice as a direct sign of the times. The belief and faith in

an unreasoned and ad hoc creativity asserts a certain smug superiority over the fears of our preceding epochs. Given the current crisis, it is too easy to mimic Oscar Newman and seek causality between appearance and global/social affect. Architecture does not operate in the causal realm; rather it is many steps removed and part of a corollary production of visual and spatial culture. Whereas causality would presume a much simpler analytical ratio, a corollary approach to architectural criticism and practice would reinsert these evaluative methods into one into another to continually produce new and valuable systems of feedback. If evaluations are by definition empirically sound, why does criticism fall so far behind to mere populism? Why are quantitative measures of user experience omitted from the design process? When “austerity” is approaching brand-status, what reconfiguration of critical tools can position architecture on a more empirically sound and more conceptually rich trajectory? Far from being mutually exclusive, the combination of observed data as a tool, not a picture, and practical willingness to integrate criticism into the design process as a dynamic tool for evaluation; architecture can reclaim a critical stance grounded in the unmediated user experience as the highest aspirations for beauty, technology, and space. In other words, the most powerful tool we can exercise as architects is that our buildings engage directly and sometimes unpredictably with our users. The architectural imperative then is to produce work that holds the user in high enough esteem to allow them to both form and communicate judgment.

**Conceptual/theoretical implications**

Descriptive criticism does not seek to judge nor
even intend to interpret, but to help people see what is actually there (Attoe, 1978). In all of its types it does not offer judgments, but merely depicts what exists; such as, how people move through space and/or provides information about the social, political, and economic context within which built environments are designed and created.

**Methodological implications**

The expanded, three-prong approach to architectural criticism advocated here implies direct feedback on the experienced quality of built environments involving all major stakeholders. Measuring stakeholders’ responses through the use of adjective descriptor scales or rating scales ranging from very satisfied to neutral to very unsatisfied means that respondents need to be presented with data gathering instruments, whether through web surveys or hard copy surveys. Furthermore, a panel consisting of laypersons and expert judges will establish the agreed upon weightings of environmental attributes ranging from health, safety and security issues to cultural and aesthetic ones. Once again, the objective of these somewhat more complicated measurements is to move from highly subjective to more objective criticism.

**Impact on emerging and future architectural practice**

With a newly empowered clientele, a more savvy cadre of practitioners, and the communication/production opportunities provided by a globally networked profession, the potential impacts on practice cannot be overstated. The insertion of an informed client base into the design process will ensure more strategic designs from schematic phases through building commissioning. Held accountable and responsible for defending and justifying costly design moves, emerging professionals will be continually challenged to engage with existing and emerging manufacturing technologies that allow their visions to be operative and cost-effective. Beyond the trite and mannerism of “digital fabrication, “revolutions and evolutions can be made in standard building practices from normative material dimensions to interoperability between distinct disciplines and trades. The trades and manufacturers therefore will evolve to provide cost-effective means of enabling ambitious design because both clients and architects are working together to normalize the previously “ambitious”. This loop is continuous and is based on each party driving for a synthesis of their interests, ultimately furthering the efficiency, quality, and satisfaction from the built environment.

**Impact on future architectural and design education**

The pedagogical implications are already established but have not found traction in the profession as it exists today. The willingness to experiment with new technologies and design methodologies is the foundation of any design
program given that the architectural process is cumulative over a lifetime. Furthermore, facility with software, awareness of social networks at all scales, and mental acuity and flexibility define the baseline curricular demands of contemporary universities. Once in the workforce, these tools are traded for top-down demands of older generations. With an increased expertise, and a concise way for all parties to communicate, students can emerge into the workforce with a refined sensitivity to clients and the profession that will minimize the "shock" of entering real-world practice.

Table 1: Major Phases in the Evolution of Architectural Criticism in the United States and its European Antecedents in Aesthetic Criticism (Source: authors).

<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Work(s)</th>
<th>Contribution to the Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1875</td>
<td>Diderot</td>
<td>Salon of 1765 &amp; Notes on Painting</td>
<td>Art/Aesthetic Criticism</td>
</tr>
<tr>
<td>1930's-50's</td>
<td>Mumford</td>
<td>Criticism at The New Yorker Magazine</td>
<td>Architecture and Urbanism Criticism</td>
</tr>
<tr>
<td>1938</td>
<td>Lewis Mumford</td>
<td>The Culture of Cities</td>
<td>Manifesto on the urban effect on contemporary life.</td>
</tr>
<tr>
<td>1939</td>
<td>Greenberg</td>
<td>&quot;Avant-Garde and Kitsch.&quot;</td>
<td>Art/Aesthetic Criticism vis-à-vis contemporary culture</td>
</tr>
<tr>
<td>1956</td>
<td>Sartre</td>
<td>&quot;Existentialism is a Humanism&quot;</td>
<td>Art/Aesthetic Criticism</td>
</tr>
<tr>
<td>1961</td>
<td>Greenberg</td>
<td>Art and Culture</td>
<td>Art/Aesthetic Criticism vis-à-vis contemporary culture</td>
</tr>
<tr>
<td>1964</td>
<td>Merleau-Ponty</td>
<td>&quot;Eye and Mind&quot;, The Primacy of Perception</td>
<td>Theorizing of perception and its role in aesthetic judgment.</td>
</tr>
<tr>
<td>1965</td>
<td>Judd</td>
<td>&quot;Specific Objects&quot;</td>
<td>Creates a separate categorization from painting and sculpture, whose descriptive quality resembles architecture</td>
</tr>
<tr>
<td>1967</td>
<td>Lewitt</td>
<td>&quot;Paragraphs on Conceptual Art&quot;</td>
<td>Description of Conceptual Art mimics architecture.</td>
</tr>
<tr>
<td>1966</td>
<td>Sontag</td>
<td>&quot;Against Interpretation&quot;</td>
<td>Critique and distinction of content and aesthetics.</td>
</tr>
<tr>
<td>Year</td>
<td>Author</td>
<td>Title</td>
<td>Description</td>
</tr>
<tr>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>1972</td>
<td>Steinberg</td>
<td>&quot;Other Criteria&quot;</td>
<td>Expands and theorizes the role of the critic</td>
</tr>
<tr>
<td>1975</td>
<td>Rosenberg</td>
<td>&quot;Criticism and Its Premises&quot;, Art on the Edge: Creators and Situations</td>
<td>Draws distinctions between history and criticism.</td>
</tr>
<tr>
<td>1977</td>
<td>Alloway</td>
<td>&quot;The Use and Limits of Art Criticism&quot; Topics in American Art Since 1945</td>
<td>Expands and theorizes the role of criticism</td>
</tr>
<tr>
<td>1977</td>
<td>Kuspit</td>
<td>&quot;Art Criticism: Where's the Depth?&quot;</td>
<td>Compartmentalizes Criticism by Medium and typology</td>
</tr>
<tr>
<td>1978</td>
<td>Attoe</td>
<td>&quot;Architecture and Critical Imagination&quot;</td>
<td>Categorizes critique into three main types: Normative, Interpretive, and Descriptive</td>
</tr>
<tr>
<td>1979</td>
<td>Krauss</td>
<td>&quot;Sculpture in the Expanded Field&quot;</td>
<td>Discusses two types of modern sculpture, &quot;Architecture&quot; and &quot;Not Architecture&quot;</td>
</tr>
<tr>
<td>1995</td>
<td>Brenson</td>
<td>&quot;Resisting the Dangerous Journey: The Crisis in Journalistic Criticism&quot;</td>
<td>Criticizing critics and criticism</td>
</tr>
<tr>
<td>1997</td>
<td>Danto</td>
<td>After the End of Art: Contemporary Art and the Pale of History.</td>
<td>Examines the disjointed value of criticism relative to the speed of contemporary culture.</td>
</tr>
<tr>
<td>Year</td>
<td>Author</td>
<td>Title</td>
<td>Description</td>
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<td>------</td>
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</tr>
<tr>
<td>1998</td>
<td>Carrier</td>
<td>&quot;Danto and His Critics: Art After the End of Art History&quot;</td>
<td>Criticism of Critics and a search for a way forward for art.</td>
</tr>
<tr>
<td>1998</td>
<td>Carroll</td>
<td>&quot;The End of Art?&quot;</td>
<td>Criticism of Critics and a search for a way forward for art.</td>
</tr>
<tr>
<td>1998</td>
<td>Fried</td>
<td>&quot;Shape as Form: Frank Stella's Irregular Polygons&quot;, Art and Objecthood</td>
<td>Fine art examined as a producer/contributor of architectural space.</td>
</tr>
<tr>
<td>1998</td>
<td>Kelley</td>
<td>&quot;Essentialism and Historicism in Danto's Philosophy of Art&quot;</td>
<td>Discusses schism between essentialism and historicism in modern criticism and the visual arts.</td>
</tr>
<tr>
<td>2000</td>
<td>Kuspit</td>
<td>Redeeming Art: Critical Reveries</td>
<td>Further explication of art/aesthetic criticism’s identity crisis relating to modernity</td>
</tr>
<tr>
<td>2003</td>
<td>Goldberger</td>
<td>Architecture Criticism: Does It Matter? Lecture at Butler University</td>
<td>Outlines peripherally the failure of contemporary criticism.</td>
</tr>
<tr>
<td>2003</td>
<td>Foster</td>
<td>Design and Crime (and Other Diatribes)</td>
<td>Systematically links our perceptions of value and architecture to a manipulated perception of capital and branding.</td>
</tr>
<tr>
<td>2004</td>
<td>Kuspit</td>
<td>The End of Art</td>
<td>Art/Aesthetic Criticism</td>
</tr>
<tr>
<td>2011</td>
<td>Foster</td>
<td>The Art-Architecture Complex.</td>
<td>Examines how our perceptions are often projected effects of buildings rather than authentic physiological stimulations.</td>
</tr>
</tbody>
</table>
Table 2: Milestones in the Evolution of Post Occupancy Evaluation - Building Performance Evaluation (Source: authors).

<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Building Type(s)</th>
<th>Contribution to the Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>Van der Ryn &amp; Silverstein</td>
<td>Student dormitories</td>
<td>Environmental analysis; concept and methods</td>
</tr>
<tr>
<td>1968</td>
<td>Manning</td>
<td>Offices &amp; Schools</td>
<td>Comprehensive building appraisal</td>
</tr>
<tr>
<td>1968</td>
<td>Sanoff</td>
<td>Any facility type</td>
<td>“Evaluation Techniques for Designers” – first monograph on POE</td>
</tr>
<tr>
<td>1969</td>
<td>Preiser</td>
<td>Student dormitories</td>
<td>Environmental performance profiles; correlation of subjective and objective performance measures</td>
</tr>
<tr>
<td>1971</td>
<td>Field, et al</td>
<td>Hospital</td>
<td>Multi-method approach to data collection</td>
</tr>
<tr>
<td>1974</td>
<td>Becker</td>
<td>Public housing</td>
<td>Cross-sectional comparative approach to data collection and analysis</td>
</tr>
<tr>
<td>1975</td>
<td>McLaughlin</td>
<td>Hospitals</td>
<td>“Evaluation of Hospitals” – first article published on POE</td>
</tr>
<tr>
<td>1975</td>
<td>Veterans Administration</td>
<td>Veterans Hospitals</td>
<td>POE of the Veterans Administration Hospital in San Diego (Building Research Board, 1987)</td>
</tr>
<tr>
<td>1976</td>
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<td>Connell &amp; Ostrander</td>
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<td>Daish, et al</td>
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<td>Marans</td>
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<td>Duffy &amp; Chandor</td>
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Figure 1: Each examination room has a unique view. Some of the sky, others the parking lot (Source: Insomniart.com).

Figure 2: Imagine having to wash all those windows after a sand storm (Source: buildipedia.com).

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References


Federal Facilities Council (2001). Learning from Our


Kelley, M. (December, 1998). Essentialism and Historicism in Danto’s Philosophy of Art, History and Theory V. 37, No. 4, pp.30-43.


Lewitt, S. (June 1967). Paragraphs on Conceptual Art, Artforum 5, vol. 5-6, pp.80


MacMillan.


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SKYSCRAPERS AND PLACEMAKING: SUPPORTING LOCAL CULTURE AND IDENTITY

Kheir Al-Kodmany and Mir M. Ali

Abstract
Because of their massive bulk and soaring height, skyscrapers immensely impact placemaking. Today, skyscrapers are not exclusive to the U.S.; they have prevailed in many other countries across the world. This paper examines the role of skyscrapers in supporting placemaking in non-Western countries; mainly in China, India, and the Middle East, which have lately witnessed a surge in skyscraper construction. Through case studies, the paper describes and evaluates skyscraper projects that have attempted to embrace traditional forms. In addition to considering aesthetics and morphological issues, the paper stresses that skyscrapers’ design should respect cultural values and practices in relation to functional issues and space utilities. It is hoped that the paper will augment design discourses on the role of skyscrapers in supporting local culture and identity.

Keywords
Skyscrapers, form-giving, culture, symbolism, context.

Introduction
Following the collapse of the World Trade Center (WTC) towers in September 2001, skeptics took a pessimistic view by calling skyscrapers death traps and hastily predicted their demise as a building typology. Surprisingly, the past decade proved that these views are invalid because we have witnessed an unprecedented construction boom of tall and super tall buildings worldwide. The Council of Tall Buildings and Urban Habitat (CTBUH) corroborate this, which went further in observing that the past decade has witnessed the completion of more skyscrapers than any previous period in history. This resurgence of tall buildings is notwithstanding the recent global economic recession. An aggressive race to earn the world’s tallest building title continues, while at the same time, cities are constructing higher buildings in greater numbers (Wood, 2011).

Aesthetic of buildings is neither the only nor the ultimate objective of architectural design. However, in the case of skyscrapers, the topic becomes more significant because their visual impact is more profound and extends in time and space. These buildings are designed to last for a long time and their sheer size and “tallness” exert significant impact on the visual appearance of the built environment at all geographic scales, from the neighborhood to district, community, city, and region. For example, Burj Khalifa sets the perceptual
characteristics of the City of Dubai to a viewer from a distance even from the outskirts of the city. Because of their significant visual impact, this paper argues that skyscrapers do impact placemaking, and therefore, studies that examine their design are needed for creating a better and sustainable urban fabric.

**Placemaking and Skyscrapers**

In many cases, skyscrapers have poorly contributed to placemaking (Al-Kodmany 2001; Jencks, 1988; Huh, 2005). In discussing the problem of ‘placelessness,’ Alan Jacobs and Donald Appleyard explained that it is often that skyscrapers evoke the image of a nerve-wracking, workaholic business environment, and in the residential context, conjure the perception that living in apartments resembling rat cages detaches people from one another. Insensitive design of tall buildings makes city spaces feel unpleasant, meaningless, and soulless (Relph, 2007; King, 1996; Kurtz, 1973; Oldenburg, 2007).

Architects and urban designers care about improving the qualitative human experience of a city’s environment by turning spaces into places for all kinds of purposes including living, working, playing, etc. Whereas the term ‘space’ represents the physical container of activities and objects, ‘place’ is a particular portion of space that meets physiological and psychological needs of people while evoking meaningful and memorable messages of a specific culture (Norberg-Schulz, 2007). Urban designers and architects care about turning spaces into places because cities constitute one of the most significant, direct, and constant human experiences of our world (Nasar, 1998).

Unlike the high visual arts -- painting, dance, music, and sculpture – that may appeal to a narrow audience, cities must appeal to the masses since people in urban communities have no choice but to experience the city daily. Such an experience profoundly impacts us: indeed, some parts of our urban experience make us feel delighted and proud of local culture and identity. However, other parts can frustrate or even depress us (Fleming, 2007). The role of tall buildings in improving placemaking is significant and it deserves rigorous examinations.

**Culture-based Design**

This research focuses on the placemaking problem created by skyscrapers from a cultural perspective. It specifically explores ways to improve placemaking by incorporating cultural cues in the design of skyscrapers. This is an important topic due to the geographic shift of tall and super tall buildings from the Western to non-Western countries. In 1990, 80% of the 100 tallest buildings in the world were built in North America; by 2010, however, about 80% of the tallest are built elsewhere (Oldfield and Wood, 2010). Overall, a universal design template of tall buildings has swept the world that promoted the emergence of a monoculture of North American design rooted in Chicago and New York (Domosh, 1996; Dor, 2004; Ford, 1994; Frampton, 1992). It is characterized by a plain steel-and-glass box, and has been transplanted into non-Western countries with little or no modifications. The model has often-submerged local cultures through universal applications of technology, business formulas, and design standards (Kong, 2006).

Culture could be viewed from multiple
perspectives. It encompasses the land and its topology, housing patterns, local language, climate, food habits, religious beliefs, art and music, to name a few. It can be viewed as the sum total of characteristic features of everyday existence, as synergetic divergences of economic, political and social life, or a way of life collectively shared by people in a place and time (Rapoport, 1977 and 1983; Harvey, 1989). People often want to sustain their customary values and traditions to demonstrate their pride in their own collective being. Tradition, by definition, is cultural continuity of customs, social attitudes, etc. handed down from one generation to another. Thus, civilizations in different regions of the world vary because people want to continue their own traditions that they inherited from their ancestors (Harvey, 1989; Held, 2007; Kroeber, 2006). Urban designers and architects take into account cultural issues so that the resulting built environment ensures cultural continuity through the conveyed visual messages and the functional design of spaces.

Experienced foreign architects of repute are often invited by developers and owners in less developed countries to provide the design of skyscrapers of special significance, such as national landmarks. This matter is of particular importance in cities that are witnessing rapid growth. The lack of experience of local professionals compels the owners and developers to take the attitude that name brand architectural firms from outside their own countries are more qualified to do the job. They don’t want to take risk with their investment on costly projects such as skyscrapers. In many cases, these firms may not be attuned to the local culture, whereas local residents may cherish their own cultures and desire to ensure its continuity via the built environment. Therefore, research on placemaking by skyscrapers accounting for local culture and traditions becomes a necessity (Krishnan and Ali, 2004; Rossi, 1982).

**Knowledge Gap**

Discussion of architectural forms and their visual reference to vernacular architecture is abundant in the post-modern architecture literature (Ali and Aksamija, 2008; Koolhaas, et al., 1995; Koolhaas, 1979; Morris, 1992). For almost two decades, a growing volume of research has artfully discussed the problem of ‘imported’ Western design and their fit or unfit in non-Western cities (e.g. Asfour, 2007; Mahgoub, 2007; Rahma, 2010; Salama, 2007). The discussions of incorporating vernacular design elements to preserve cultural identity reflect rigorous analysis of the conflict between local versus global or vernacular versus international style architecture. However, these discussions indirectly examine skyscrapers (Choi, 2011). We rarely find dedicated research that focuses on skyscraper design and its contribution to local contexts. In some cases, scholars surrendered to the fact that non-Western cities lack any skyscraper precedence or “vernacular skyscraper” examples; and therefore, they accepted the notion of “importing” skyscrapers from abroad (Riley and Nordenson, 2003; Scholte, 2000).

This paper attempts to fill this knowledge gap by examining some recently built skyscrapers that largely depart from the typical glass-and-steel model. The design of these skyscrapers is significant because they attempted, with various degrees of success, to relate to a
specific culture and context. Cultural studies encompass a wide-spectrum of issues including lifestyle, habits, conduct, visual representations, and symbols (Rapoport, 1983). This paper offers a discourse on issues related to forms, aesthetics, and placemaking, and it examines them in the context of major skyscraper projects in different parts of the non-Western world.

Any meaningful discussion of aesthetics and forms, two attributes or qualities of tall buildings, often risks formulating subjective judgments. Both these qualities lack precise definitions and can be judged but not measured. The aesthetic appeal of a building can be elusive to a designer but critical toward the outcome of the design. What delights one person may be just interesting to someone else, or may not delight another person at all. Thus, beauty is subjective and emotive. “A thing of beauty is a joy forever” are words of wisdom with universal appeal, yet the expression “beauty is in the eye of the beholder” appearing in the 3rd century BCE in Greece, clearly brings to attention this ongoing dilemma. Although there have been attempts to formulate the so-called rules of aesthetics, there is no universally accepted theory of aesthetics. As Torroja (1958) stated “...the designer must rely more on his instinct and artistic background than on hard and fast rules, for it is more difficult to formulate rules in the field of art than in technology, especially if these rules are not merely nebulous philosophical considerations on art, lacking direct contact with the specific problem.” It is this kind of instinctive approach based on best judgment that was taken in critiquing the following case study buildings. Every tall building design should be considered unique and even when some basic rules of design are applied, an imaginative adjustment will invariably result in improvement. Any generalization of aesthetic rules should therefore be treated with great care and caution because it will inhibit the designer’s free spirit for exercising creativity and power of imagination with niggling regimentation. The paper therefore attempts to address this problem arising from the subtle dichotomy of subjectivity versus objectivity by sharpening the focus of the discussion on the prime objective of the research and by examining actual projects of built skyscrapers using factual information. The focus is on studying a new trend that strives to apply culturally dominated form-giving to skyscraper design. While we tend to give credit to designers for making their well-intentioned attempts, the examinations go further by critically assessing the outcomes. Do the resulting forms truly relate to local cultures and traditions? Were the claims by the architects successfully translated into the actual forms, or do the design claims constitute empty philosophical rhetoric? These are some of the questions addressed in the interpretation of the design outcome of the case study examples that follow.

Case Studies

The following case studies come from Asia and the Middle East, which have been lately most active in constructing tall buildings. In addition to incorporating cultural esthetics into the design of these skyscrapers, they also enjoy significant heights, floor areas, and intriguing forms.

East and Southeast Asia

With an exploding population migrating from rural areas and small towns to large cities,
particularly in Asia, problems of residential and commercial/mercantile accommodation continue to magnify. The future of these cities lies in the inevitable construction of high-rises, unless an alternate solution is found for creating architectural spaces, and efficient infrastructures. As many Asian cities are experiencing a population explosion and economic expansion, the unprecedentedly rapid rise of the urban scale in the early 21st century is leading to the creation of megacities with populations exceeding 20 million. A dilemma that faces urban designers and planners of all newly emerging Asian high-rise cities is to come up with a new model of development; that is, how to move away from established Western models and establish new Eastern models of urban growth, or combine Western models with past historical and evolving Eastern models. Regardless to success or failure of their design, today tall buildings can be seen in many Asian cities including Tokyo, Kuala Lumpur, Jakarta, Singapore, Seoul, Hong Kong, Shanghai, Beijing, Nanjing, Shenzhen, Guangzhou, and Taipei, to name a few. China is leading the wave of new skyscraper construction at the time of this writing.

The Petronas Towers
The 452m (1,482 ft) high, Petronas Twin Towers in Kuala Lumpur, Malaysia, were the tallest in the world from 1996 to 2004. In terms of architectural
design, the Malaysian government required Cesar Pelli, the architect of the project, to infuse certain cultural elements of the region into the towers’ design. Consequently, the architecture of the towers emphasized the Islamic and oriental use of symmetric geometry both in their outer view and within the interior, where the plan consists of interlocking semi-circle and square geometrical elements creating a 16-sided form. The resulting geometry of floor plans is intriguing and by extruding it, each tower resembles a tall minaret from a distance. The towers evoke the imagery of ancient architecture, such as the Islamic Qutub Minar (Minaret) in Delhi, India (see Figure 1). The lighting system of the tower is also well-designed; it reinforces the minaret’s imagery at night (see Figure 2), (Dupre, 2008; Pelli, 2003; Terranova, 2003).

Figure 2: Petronas Twin Towers at night, they evoke the image of Islamic minarets (source: skyscrapercity.com).
Jin Mao Tower
Designed by Skidmore, Owings & Merrill (SOM), Jin Mao’s architecture was inspired by the ancient pagoda so that the building gives a culturally-rooted identity to the skyline of Shanghai, China. It is a trend-setting tower located in the Pudong area of Shanghai that propelled other developments and construction of skyscrapers there making Shanghai a skyscraper city. Rising to 421m (1,380 ft), the building’s setbacks throughout the façade create the biomorphic form of stepped pagodas reverting to the traditional local imagery (Lepik, 2008, p. 126-127), (see Figure 3). The tower recounts the many ancient pagodas that still dot the mountainsides. The 88-story

Figure 3: Jin Mao Tower in Shanghai, China reverts to the Chinese traditional pagoda form consisting of a series of steps along building height. Its image clearly evokes local cultural association (Source: Photograph by K. Al-Kodmany).
tower follows the Chinese good luck charm of the number eight by having eight vertical segments with decreasing height of each higher segment by one-eighth of the height of the adjacent segment below. The base of the tower is another important component of Jin Mao. It is six stories tall holding yet more uses: hotel function areas, a conference and exhibition center, a cinema auditorium, and a 20,749 m² (226,000 sq ft) retail galleria. The top of the tower consists of a crown-like steel pinnacle, reminiscent of the Art Deco style. Jin Mao has earned a special recognition in the history of tall buildings. It is recognized as one of the two best architecture design projects in mainland China—the other is Xianshan Hotel in Beijing by I.M. Pei (Slater, 2009).

**Urban Forest Tower**

According to MAD Architects, the design of the Urban Forest Tower in Chongqing, China, aims to evoke the unique nature found in the oriental ancient world, which is lost in today’s Chinese cities. The tower attempts to bring nature back to the modern city by providing an oriental garden at each floor of the 385m (1,263 ft) high tower (see Figure 4). Truly, the curved floors of the irregular shape lined with...
lush greeneries evoke the Chinese mountainous landscape and brings wilderness to the city. This project takes place in an economically growing city that follows Western architecture and urbanization models—similar to what is happening in other fast growing cities in China. Urban Forest Tower is meant to counter the prevailing trend by making the design revive local culture and nature. The excessive local nature of the Urban Forest counterbalances the dominant “concrete jungle” in a city that once enjoyed splendid scenic qualities.

**Taipei 101**
Taipei 101, also known as Taipei Financial Center, was built in 2004, and was the tallest building of the world until 2010. Rising to 509m (1,670 ft), similar to the Jin Mao Tower, the tower’s form was inspired by the traditional pagoda. Designed by architect C. Y. Lee, the tower steps back eight times because again the number eight is considered to bring good fortune. With the I-Ging-based theory of eight floors as a pod, with one pod as a joint and joints forming the structural entity, Taipei 101 seems to march upward to the sky. In conjunction with the pagoda symbolism, the tower also recalls the imagery of local bamboo sprouts soaring upwards node by node, expressing progress and prosperity (Lepik, 2008, pp. 134-136). The giant structure of the tower clearly belongs to the local culture, yet its massive scale overwhelms its surrounding environment (Terranova, 2008, pp. 130-139). The application of symbols and totems is intended to convey the message of fulfillment. The talisman symbols and totems are deployed at proper locations of the building (see Figure 5).

**Shreepati Skies**
Shreepati Skies in Mumbai, India, is a residential tower designed by architect Reza Kabul. The 81-story Shreepati Skies, however, promises to be unlike any other structures in India because of its unique form. In an articulate manner, the building design evokes the image of a dancing native lady posturing with a water pot symbolized at the tower’s top (see Figure 5).
Despite the contextual misfit of the tower being totally out of scale and dwarfing its neighboring buildings, the tower’s form is iconic and unique. According to the architect, the tower’s dynamic transformation -- from a cubic form in the base to semi-cylindrical in the shaft, then, to a cylindrical at the top was intended to capture the art form of an Indian dancing woman. Consequently, the Shreepati Skies is nicknamed “the dancing lady.” The design of the tower is also well accentuated with its simple lighting system.

**Naga Towers**

The 54-story (230m /755 ft) Naga (snake) Towers in Gandhinagar, India, are designed to convey a modern version of Indian architecture that cherishes the Indian cultural symbol of the Naga (snake). The Naga is an integral element of India’s cultural ethos, tradition, and religion. The Naga image is a symbol of spiritual truth and energy that spread throughout the Hindu and Buddhist cultures. The snakelike design is evident in the embraced form of the buildings. According to ECADI architects, “the springing and leaping action of the snake is reflected in the form of the buildings in a symbolic indication of awareness and vitality...the Naga concept of duality and contradiction is represented in the double motif that eventually joins to make one building” (see Figure 7), (GIFT, 2009). Naga Towers will be built in one of India’s largest urban projects, the Gujarat International Finance Tech-City, which is poised to contain several dozen skyscrapers.
The Middle East
Aside from East and Southeast Asia, there is a boom in tall building construction in the Middle East. The oil rich Middle Eastern countries like UAE, Saudi Arabia, and Qatar have been recently building spectacular tall towers in their cities. Abu Dhabi, Dubai, Doha, Mecca, Jeddah, and Riyadh are some cities where tall buildings are being constructed at this writing, with Dubai leading the list. Although some of the major projects are on hold and some are cancelled because of the present global economic recession, they are poised to be realized once the current financial gloom is over. The motivation for building the tall towers is not so much a high population density, but to attract business and compete with the rest of the world, and for demonstrating economic prosperity. In Mecca, Saudi Arabia, the 601m-(1,972 ft) tall Abraj Al-Bait Towers Complex (also known as Mecca Royal Clock Tower) across and overlooking the site of Islam’s holiest shrine, the Kaaba, is nearing completion. It will have a large elevated clock, a seven-star hotel, an enormous prayer area, and shopping mall, and when completed it will be the tallest building in Saudi Arabia, the tallest and largest hotel in the world, and have the largest floor area of any building in the world. At this writing, construction of another 1,000m- (3,281 ft-) high Kingdom Tower in Jeddah has recently been approved by authorities. If built, it will be the tallest building in the world surpassing the height of the Burj Khalifa. Doha, Qatar -- another skyscraper city -- has seen unprecedented growth in tall buildings. Among others, Burj Qatar is a supertall building rising 231m (760 ft). The 300m (984 ft) Aspire Tower is the tallest building in Doha at...
present. Another ultra-tall skyscraper, the Doha Tower, rises 550m (1,805 ft); construction of the foundation was begun, but has been put on hold. If built, it will be the tallest in Qatar, and one of the tallest in the Middle East.

**Burj Al-Arab**

According to the building’s architect, Tom Wright, the client’s goal was to create an icon for Dubai; a building that would become synonymous with the city, as Sydney is associated with its Opera House and Paris with the Eiffel Tower. At 321m (1,053 ft), Burj Al-Arab is one of the tallest hotels in the world. It stands on an artificial island out from Jumeirah beach, and is connected to the mainland by a private curving bridge. The tower’s shape mimics the sail of a ship; and thus it makes a vivid reference to the key traditional sea economic activities of the City of Dubai. The sail shape is articulated by employing innovative structural and cladding systems that coalesce various technologies, including large steel X-trusses and translucent white fabric stretched around the structural frame — thereby evoking the sail of the dhow (see Figure 8). The fabric's translucency allows the entry of daylight into the interior in a diffused form and recalls the tent, an Arabian vernacular structure that responds well to the desert environment (Dupre, 2008, pp. 122-123). During the day, this white wall glows to illuminate the full-height atrium at 180m (591 ft). At night, a complex arrangement of changing projected lighting makes Burj Al-Arab a dynamic beacon seen from outside, while providing a dramatic illuminated show seen from the atrium within. The

![Figure 8: The 60-story Burj Al-Arab in Dubai evokes the image of a floating boat with a sail as a symbol of traditional activities at sea of Dubai. (Source: Sketch by K. Al-Kodmany).](image)
building’s sail-shape is located in a prominent spot along the shoreline and has noticeably altered Dubai’s skyline.

**Burj Khalifa**

Designed by SOM under the leadership of architect Adrian Smith, and soaring to 828 m (2,717 ft), Burj Khalifa in Dubai, UAE is very slender in form and silhouette and currently holds the title of the tallest building in the world. The 160-story tower is a mixed-use building that houses a boutique hotel in the base, apartments occupying levels 20 to 110, and offices above.

According to the architect Adrian Smith, the greatest source of inspiration for Burj Khalifa’s form and geometry was a native desert flower, highly popular and widely cultivated in Dubai,

Figure 9: Dubai, the new ‘instant’ high-rise city with its most notable tower, Burj Khalifa, the world’s tallest building. (Source: Adrian Smith + Gordon Gill Architects; photograph by J. Steinkamp).
and the filigree patterns of traditional Islamic architecture. Named “Hymeocallis,” it is a white lily with petals radiating out from the center. The three-leaf flower’s structure is one of the organizing principles in the tower’s design, where its shape is made up of a buttressed core that has three wings extending out of the core. The wings provide structural support and helps withstanding wind. The Y-shaped footprint design of the tower takes advantage of a buttressed tube structural concept and creates a variety of different spaces inside the building offering wide views to the city (Baker, 2004), (see Figure 9).

The tower has 15 tiers or groups of commonly shaped floors over 100 stories. They are staggered in a spiral stepping pattern. Consequently, the tower’s width becomes reduced each setback in order to mitigate wind’s impact. Special materials like textured steel panels, reflective glazing and aluminum are employed to resist extremely high temperatures typical in the UAE (Weismantle, et. al, 2007). The tower is part of a planned 500-acre complex of offices, hotels, shops, lagoons, and public space that will be a technological, economic, and social oasis. The building’s inauguration took place on January 4, 2010.

**Nakheel Tower**
The proposed Nakheel Tower mega-project in Dubai, which is on hold at present, was planned to accommodate over 55,000 inhabitants, and if

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![Figure 10: Nakheel Tower. The tower’s design was based on Arabic-Islamic geometry (Source: Mitcheseson-Low and O’Brien, 2009).](image-url)
built, would soar to 1 km (0.66 mi) surpassing the height of Burj Khalifa. Building on the theories of past visionaries such as Le Corbusier, Frank Lloyd Wright, and Paolo Soleri, the Nakheel Tower’s scheme is the true realization of a vertical city. The tower’s design was inspired by the Arabic-Islamic geometric patterns characterized by radiating circles forming 16-pointed stars. As these circles crossed the circle of the plan they created a series of overlapping crescents—a known Islamic symbol (see Figure 10).

It is often true that supertall buildings are planned around a single core and they taper towards the top to mitigate wind forces. The Nakheel Tower, in contrast, is divided into four separate towers so that it allows the wind to pass through. This design will allow maximizing floor-plates at high levels. The individual towers are connected through skybridges at every 25 levels. The triangulated form and similar geometric features—characteristics of Islamic motifs—can be seen in other recent buildings such as Dubai’s Emirates Tower and the Al-Faisaliah Center in Riyadh, Saudi Arabia (Mitcheseson-Low and O’Brien, 2009).

**Discussion**

Skyscrapers, by the very nature of their imposing height and scale, are intrusive into the built environment. Some literature hinted that regardless of the design of its skin, a super tall structure does not comfort with any local (i.e., low-rise) design traditions in the non-Western cities in which they are currently being constructed (Goldberger, 2004; Beedle et al., 2007). Ultimately, by their sheer scale alone and visual dominance within the urban landscape, they only serve to undercut national culture and vernacular character. On the other hand, if they are designed well and placed in proper locations, they can arguably enhance placemaking and act as anchors that invite new urban developments around them and foster economic growth and social life. Keeping this in mind together with considerations for cultural association and morphological characteristics, the abovementioned case study buildings are critiqued as follows.

**Design Review and Criticism**

Undoubtedly, today’s skyscrapers combine art and architecture, and herald the beginning of technological supremacy and conquest of space with new urban forms. They are causing major transformation of the world’s great cities, particularly those that aspire to be the centers of finance, tourism and entertainment. These new urban giants with their futuristic forms that are populating the world’s major cities, despite their glamour and awe-inspiring outsized and out-of-proportion heights, are not without their shortfalls.

**Superficiality:** The skyscrapers project examples show design attempts that departed from the typical glass-and-steel tower prototype, in favor of forms that support local identity and placemaking. Some of the examples are more successful than others in terms of providing direct visual references to a particular context. For example, the designs of Taipei 101 and Jin Mao embrace the pagoda form and relate directly to the Chinese culture. Similarly, the embraced form of Petronas Towers in Kuala Lumpur was based on Islamic architecture and regional character. The spirit of the geometry is Islamic, and the geometric pattern is found throughout the country in architectural...
ornaments and decorative arts (Pelli and Crosbie, 2003). The design of these towers could be considered place-based. Simply speaking, the Petronas Towers will be inappropriate in a Chinese city such as Shanghai and vice versa: Jin Mao will be inappropriate in Kuala Lumpur (Mitcheson-Low and O’Brien, 2009).

Nevertheless, some of the finer design issues are questionable; for example, does reference to eastern numerology actually signify serious cultural accommodation and improve sense of place? Admittedly, the lucky number eight is based on Chinese tradition and hence the design embraced this notion. To a non-Chinese critic this may even sound superstitious but to the Chinese folks this could be an important part of their belief system. However, most viewers will not be able to tell or may be indifferent to the fact that the design of these buildings was based on this lucky number.

Other towers such as Burj Khalifa and Nakheel Tower are less successful in terms of supporting placemaking. For example, a native plant inspired Burj Khalifa’s design but this can be seen only in the floor plans. The resulting form of Burj Khalifa does not remind any observer of the local plant, native forms, or local culture. Despite the claims by the architect, the tower’s design does not explicitly relate to Islamic and local culture. In fact, its form when seen from a distance reminds a viewer more of the needle-shaped visionary mile-high Illinois Tower of 1956 by Frank Lloyd Wright, rather than anything Middle Eastern. In the same vein, it is claimed that the design of Nakheel Tower was based on Islamic geometry. However, this can be seen only in the floor plans and their effect is lost in the shaft design. Consequently, the tower does not communicate a clear connection to Islamic architecture.

Scale violation: Another common problem with these skyscrapers is that many of them are out of scale, out of context, and out of place (see, for example, Figures 5 and 6). Because of their extreme height, they tend to dwarf their neighboring buildings and largely violate human scale. In these cases, skyscrapers’ visual exposure in the sky is immense and they do constitute a problem to placemaking at the sidewalk level. They declare their individuality and glory, and they are all about themselves. A better arrangement of skyscrapers will be achieved through providing a height transition so that nearby buildings rise gradually creating an iconic skyline that do not create an abrupt and radical change in the city’s silhouette.

Extravagance: Further, many of the skyscraper examples in this paper have been criticized for being lavish and extravagant manifesting the dreams of an emerging wealthy culture and capitalist society. Their exterior design is monumental and their interior design and décor are excessive and even ostentatious (Dupre, 2008; Lepik, 2008). For example, although Burj Khalifa has attained global status, the exorbitant cost to build it in a rather low density city is hard to justify at a time when we note the downturn of the world economy, a possibility that always should have been anticipated, and has reportedly resulted in excessive vacancy rates and revenue losses. The enormous wealth spent on the tower arguably could have been better spent on social and technological projects (e.g. education, research and development, healthcare, etc.) and on developing self-sustaining manufacturing industries that the
region, as a whole, needs for social uplifting and future long-term economic development.

**Design Challenges**

Providing novel forms to any building is a considerable architectural design task. However, this issue is more challenging in skyscraper design since the building needs to withstand greater wind and gravity forces. Due to structural issues, the building shape has to conform to verticality and is limited in tapering in or out or embracing unconventional forms. In many cases, the skyscraper form is a result of the same economic formulae and functional floor-plate layouts resulting in indistinguishable architecture (Irish, 1989; Holleran, 1999; Willis, 1995). Functional, mechanical, technical, and electrical requirements may further restrict form giving. Nevertheless, recently, architects have been noticeably ambitious in their attempts to provide new forms for skyscrapers. Empowered with new building materials, sophisticated construction techniques, and robust structural software, architects have been attempting to provide new creative design of unique styles and brands. The following discusses key design challenges when it comes to choosing skyscrapers’ outfits that symbolize local cultures and traditions.

**Shortage of inspirational sources:** Architects will need to be very creative in making their contemporary skyscraper design relate to a particular cultural context (Weismantle, et. al., 2007). When faced with the challenge of designing a new mega-project, they look for symbols or other sources of inspiration from nature or elsewhere to formulate a design statement. Traditional built environments offer limited forms that could inspire skyscraper design. Such environments have been mainly characterized by low-rise architecture, and consequently they contain limited applicability to vertical architecture. For example, the pagoda is a unique traditional East Asian form and it is possible to emulate in contemporary tall building design. However, several critical questions may arise. What vertical vernacular architecture other than pagoda does Asia offer? How many more skyscrapers can embrace the pagoda form in their design? If every Asian skyscraper embraced this form, then the city’s appearance will suffer from sameness and boredom. In the context of Islamic architecture, the minaret is a vertical element that represents vernacular Islamic architecture, which knowingly or unknowingly led to the form-giving replication by the Petronas Towers’ design. However, how many other vertical elements does Islamic architecture offer for tall building design? There are only a few cities in the Islamic world, such as Sana in Yemen that offer traditional high-rises. Consequently, applying traditional forms to modern skyscrapers is a challenging task. The design complexity is ambiguous and does not appeal to ordinary observers who are not interested in philosophical underpinnings or subtle metaphors that architects and architectural critics can see in them. One may even go to the extreme viewpoint and ask: What has a pagoda, a place of worship, or Islamic architecture to do with these modern profit-seeking skyscrapers mainly housing secular corporate offices, hotels, etc. that cater to human needs other than religious? Is this symbolism necessary and even appropriate?

**Copying Western design:** The dilemma of choosing culturally-inspired or non-culturally-inspired forms is intensified when individuals of
the local culture demand Western architectural style perceived to be fitting with modernity. Research has indicated that in developing countries some local firms have consciously and deliberately emulated Western modernist and post-modernist architecture (by incorporating Western symbols or features, such as Georgian shutters and columns) as up-scale marketing schemes to attract upwardly mobile middle-class residents and businessmen to these new projects (Olds, 1995; Kong, 2006; Wu, 2000). In response to such a problem, city officials and urban designers may provide guidelines that indicate when it is vitally important to incorporate cultural references in the design, and when it is less needed. For example, signature skyscrapers of national significance could receive highest emphasis and therefore, architects will be required to make their design unique and tailored to the specific culture. Political leaders and governments have an important role in establishing and reinforcing such rules. In the case of the Petronas Towers, the Malaysian Prime Minister Mahathir Mohamad and the government required the architect of the Petronas Towers, Cesar Pelli to incorporate cultural and Islamic references into the Towers’ design. The Petronas Towers are of national significance to Malaysia and therefore, the political backing and recommendation of incorporating cultural references were appropriate (Abel, 2003; Baker, 2004). The rhetorical question arises: should politicians or city officials exercise control over the form-giving of tall buildings? On the other side of the coin, without any specific mandated guidelines or the influence of political leaders, if every building imitates the Western architectural style, very soon the so-called “Manhattanization” of world cities will take place. Cities will then begin to lose their own identity and turn into “placeless” places (Ramon, et al., 2003).

**Preservation of the historic fabric:** In the event of incorporating skyscrapers in historic districts, the skyscraper design and architectural fit become more challenging. Ill-conceived and “foreign” design of new towers placed next to historic fabric will cause irreparable damage to the existing character and image of the city. For example, contentious debates were fueled when the London’s modern-looking Swiss Reinsurance Building complying with the contemporary pluralistic architectural style was proposed to be placed amidst an area of buildings dominated by Victorian style, particularly near the St. Paul Cathedral. One way to avoid such a problem is to locate skyscrapers in clusters away from the historic districts. An example of this approach is provided by the City of Paris, which dedicated the LaDefense district as a home for tall buildings away from the historic district (Sciocolone, 2012). Some of the recent innovative modern design that is being built in this district is the Tour Phare (Phare Tower). Some historic cities may place strict rules that completely prohibit high-rise construction, as is the case of Jerusalem. Such practices could be difficult to apply in cities that face rapid growth, economic boom, and population explosion.

**Conclusion**

Skyscrapers have become a force of American cultural hegemony all over the world and resulted in the loss of many global cities’ identity (Kostof, 1995; Tomlinson, 1999). As early as in 1981, the notable architectural critic Paul Goldberger has lamented that all world cities
have begun to look alike and explained that the skyscraper is a contributing factor for urban landscape homogeneity. However, skyscrapers of distinct culturally inspired forms may improve city’s identity and placemaking (Findley, 2005). To communicate to the world their economic prosperity and scientific advancement, some cities are currently striving deliberately to create iconic skyscrapers. Today’s skyscrapers generally have become inherently iconic mega-objects, and they have an important role to play in supporting placemaking. Skyscrapers of national significance should in particular be designed so that they retain the heart and soul of the city and the region. It is expected that skyscrapers will inherently remain tall and influential, and will have a significant impact on placemaking. If placemaking is not given due considerations, there is a danger that no matter how crucial tall buildings may find their way into the milieu of the future city’s visible artifacts to accommodate the growing world population, they are also likely to turn into eye sores and unwanted burdens on the urban fabric.

From a cultural perspective, this paper has dwelled on skyscraper design attempting to embrace forms inspired by vernacular architecture and landscape. The design examples presented here have consciously and admirably departed from the international design template of skyscraper characterized by a plain steel-and-glass box, which has often been “copied and pasted” in many countries around the world, of course not without their own shortcomings and nuances. These limitations of an unwarranted overdose of cultural infusion have been pointed out in this paper. Placemaking with tall buildings is indeed a challenging design issue of our time. While not entirely successful, the examined project examples pioneer efforts to consider cultural aesthetics in skyscraper design and point to a design direction that is worth exploring and propelling further.

**Future Research**

This paper has addressed issues related to form and appearance of skyscrapers in their cultural context. However, cultural issues related to skyscrapers are far broader than the ones addressed in this paper. Future research will be directed along this line of research by addressing issues such as cultural use of spaces in skyscrapers, the spatial and vertical composition, appropriateness of symbolism, and the interior design of individual spaces. As a vertical city, the architectural program of a skyscraper should be examined against cultural needs, values, and preferences. Investigating the relationships between public, private, and semi-private spaces is particularly important with the advent of mixed-use skyscrapers in recent times. It is important to examine how a particular culture will re-arrange skyscraper’s spaces (office, hotel, residential, and public amenities) so that design will support cultural values, such as the value of privacy. Residential tall buildings have their own challenges dealing with the socio-cultural conditions. In addition, those tall buildings that are responsive to local climate, which historically has been a principal determinant of local building typologies and forms as well as of social norms and cultural life, need more investigation (Al-Kodmany, 2000).

Further, the location of skyscrapers in relation to public and private transportation is important. While some cultures consider mass-transit as an acceptable means of transportation to all social...
classes, other cultures consider mass-transit as unsuitable to affluent residents (Malik, 2001). Engaging researchers in the aforementioned cultural issues will complement the work of this paper.

References


Dor, D. (2004). From Englishization to imposed multilingualism: globalization, the Internet, and the political economy of the linguistic code. Public Culture. 16 (1), 97-118.


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THE (RE)CONSTRUCTION OF PUBLIC SPACE IN TODAY’S MEXICAN CITY

Mauricio Hernández Bonilla

Abstract
Public space is the setting of public life and ideally functions as a forum for political action and expression; as a ‘neutral’ or common ground for social interaction, intermingling, and communication; and as a stage for social learning, personal development and information exchange. Throughout history, communities have developed public spaces that support their needs, whether these are markets, places for sacred celebrations, or sites for local rituals. As the social, economic, and political centres of cities, they have played a variety of roles in human life at the physical, psychological, social, political, economic and symbolic levels. However, in contemporary urban life, public spaces have lost a lot of their value and contemporary trends have constrained their development. Nowadays, more than 75% of the population of Mexico lives in cities, yet poverty, insecurity, social and physical fragmentation, and low quality environments are the main characteristics of Mexican urban spaces. This paper intends to examine how the transformation and appropriation of public space is taking place socially and spatially in the diverse and contrasting settings of contemporary urban Mexico. In this context, it is crucial to discuss how Mexican cities should reconstruct and reproduce their public spaces to meet the challenges of the 21st century and build more responsive and sustainable urban environments.

Keywords
Public space, Mexican city, urban transformation, public life.

Introduction
Public spaces in cities are important for health, well-being, learning, conflict resolution, tolerance and solidarity (Shaftoe, 2008). They are the settings where history, culture, development, progress and even the drawbacks of a society become visible. In this sense, public urban space and the public realm are useful indicators of how societies are coping with the new challenges posed by the contemporary economic, social and environmental trends of the 21st century city.

Today, Mexico’s urban centres are the product of an increasingly diverse range of actors, interests and values. Various contrasting approaches to producing, transforming, and managing urban environments in terms of territorial growth, housing production, urban and economic development and revitalization can be identified. In this context, cities are
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built and rebuilt not only under the influence of current tendencies, but also according to traditional and emerging political, social and cultural practices particular to present day Mexico.

Nowadays, in urban Mexico, different forms of public space production and consumption can be observed. On the one hand, in the affluent areas of most cities, public urban space reflects contemporary economic trends and the dominance of wealth; on the other hand, public spaces in traditional areas and lower-income neighbourhoods reflect completely different rationalities and dynamics.

This paper intends to examine how the appropriation and transformation of public space is taking place socially and spatially in the different and contrasting settings of contemporary urban Mexico; it will also discuss specific examples of the (re)construction of more “habitable” and “democratic” urban spaces. The main question is: ‘How are Mexican cities reconstructing and reproducing their public spaces, through these various processes, to meet the challenges of the 21st century?’

Contemporary Constraints on Public Space

Public space, like the city as a whole, is both container and content. It is a space for being: physically, socially and culturally. However, public space is not only a stage or setting: it also implies a process of social production which includes all those social, economic, ideological, and technological factors that result, or seek to result, in the physical creation of the material setting (Low 2000). Moreover, public space is also a social construction, which implies the consumption of the space produced.

These perspectives involve looking at urban space in relation to how places are used and appropriated and what meanings derive from those spaces in the minds of those who consume them. In this way, public space is produced and consumed by everyone that lives in cities: urban managers, local authorities, planners, designers, ordinary citizens, visitors and tourists - all the actors that make and transform cities, leaving their imprint on urban settings.

Since the end of the 20th century, several analysts have examined the different aspects that constrain contemporary public space in cities. In terms of the fragmentation and privatisation of public space, Richard Sennett (1994) proclaims the death of truly public space, the triumph of modern individualism and the loss of confidence in public and community experiences, which is manifested in the increasing social apathy towards public life in contemporary urban societies. Similarly, Loukaitou-Sideris (1988: 7) argues that public life has become spatially disjointed, dispersed, and discontinuous. The educational, informative and communicative character of public space has also weakened. Some of these functions have migrated, largely to the private sphere. Boyer (1996:9) suggests that the ‘public’ has become a negative concept, in contrast to the ‘private’ which has been refurbished with an exalted ‘image’. This has contributed to a decline of public life in which public space has become, ‘empty space, a space of abstract freedom but no enduring human connection’ (Sennett, 1994: 375).

Other researchers have argued that the modern city offers an increasingly inhospitable environment for the widespread enjoyment
of and use of public space. Çelik et al (1994) argue that in many parts of the world, streets no longer seem to be a viable social and cultural space. She affirms that there has been a disengagement from the city because it is a place of uncontrollable diversity (Çelik, et al. 1994). Similarly, Valentine (2001:199) points out that, ‘the public realm, rather than being a social order of civility, sociality and tolerance, has increasingly become one of apprehension and insecurity.’ Fear of crime is closely associated with perceptions of who occupies and controls the space of the street, and is leading people to avoid public space and a spiral of avoidance and abandonment is setting in (Valentine, 2001: 178; Porta, 1999: 144).

Transport and communication technologies have also constrained urban public spaces. In most traditional cities, before the common use of vehicles, the street was an extension of the buildings that faced onto it. People sat in chairs in front of their homes, and businesses displayed goods on mats and tables in the street. With the rise of motorized vehicles, the street became less a part of the community and more of a place for transient strangers, and people passing through (Ford, 2000: 6-7). Nowadays, public spaces have often become residual spaces, used for parking cars, or at best associated with particular limited functions, such as tourism and retail (Çelik et al. 1994; Madanipour, 2003).

Moreover, Madanipour (1999, 2003, and 2010) argues that the growing size of the city has led to a specialization of space, which has dismantled the symbolic and functional coherence of both public and private spheres. Furthermore, a disconnection between private and public space in these pseudo-public spaces, such as the fortified shopping mall, has contributed to the decline of the significance of public space (Çelik, et al. 1994). Similarly, bazaars and market places have been exchanged for window shopping in malls, where the shopper has been converted into the passive spectator, the isolated individual, silently contemplating merchandise (Crawford, 1992:17).

In this way, the increasing intervention of the private sector in public space production has contributed to the privatization of space, and now public space is treated as a mere commodity (Loukaitou-Sideris, 1988; Burgers, 2000; Madanipour, 2003). This situation has led to the reduction of their ‘publicness’ and the emergence of a shifting process from being somewhat ‘open’ to somewhat ‘closed’ (Davis, 1990; Sorkin, 1992; Mitchell, 1995; Gullick, 1998). Sorkin (1992: xi) regards this as the emergence of a new kind of city, a city without a place attached to it, where a disaggregated patchwork of urban fabric forms a bland, senseless environment.

In contrast to these arguments, which are mainly drawn from cities in the northern hemisphere, with regard to public life and spaces in the present day Latin American city, Segre (2002) argues that despite the adoption by the minority elite of imported models and habits, most people’s everyday life and recreational activities in Latin America and the Caribbean continue to be concentrated in open public spaces. The majority of Latin Americans still wish to experience the city rather than retreating to isolated shopping malls. Streets, parks, plazas, and promenades constitute spaces for encounter and hold a social value in opposition to the individualist city of the elite (expressed in
gated neighbourhoods and shopping malls). In contrast to those who argue about the exalted image of the private, in Latin America people claim the need for a more outdoor public life, as demonstrated in research carried out by the United Nations Development Program-Chile 2000 (UN 2000), in which the demand for public space was expressed.

Public Space Transformation in the Contemporary Mexican City

Different facets of public space can be observed in Mexican cities. In this context, public space represents an important source of information about the history, culture, social values, and contemporary development of Mexican society. Whilst public space shows the prominence of a great heritage, culture and collective life, unfortunately, the drawbacks of contemporary Mexican society are also evident.

Mexico is a country with huge social and economic differences and contrasts: while there is a small elite dominating most of the economic power, there is also a large majority of the population living on the margins of economic, social and human development. In the public realm, one can observe the constraints of contemporary urban Mexico. On the one hand, several factors are evident, such as unemployment and social exclusion; lack of adequate land tenancy policies or social services; urban blight and fragmentation; precarious housing conditions and poor urban infrastructure, while on the other hand, financial capital and interests can be seen modifying cities for the benefit of the highest income groups, in privatized developments which only a few have access to.

This situation is apparent in the physical characteristics of the space, social interaction, political protests and all the practices of appropriation that people carry out in city centre streets and squares, on pavements, in parks and market places and other urban spaces in their neighbourhoods. In this way, Mexican cities exemplify public space with the characteristics described and discussed by public space analysts and researchers. Renovation and beautification of public places is constant, especially in historical areas, an elite-exclusive city is promoted in new luxury/high-end developments, and abandonment and neglect are the normal condition of many marginal public places, where social fragmentation, exclusion and insecurity are often common characteristics.

The Values of Social Equity

In low-income peripheral neighbourhoods and some other fragmented environments, public space embodies the precariousness and marginalisation of the community. However, through the struggle to defend, protect and improve public places, residents develop a sense of belonging and attachment, and learn to value public space, which leads to actions for improvement. We may think that the urban poor in Latin America are not interested in public spaces, but on the contrary, there are residents in low-income neighbourhoods who aspire to urban continuity rather than discontinuity, integration rather than fragmentation and spatial quality rather than merely satisfying basic necessities, and this is shown in the different public spaces developed in low-
income neighbourhoods. In Mexico, streets, parks and pavements have been built by the low-income population through solid collective participation (see Figure 1).

In the city of Xalapa, Veracruz, inhabitants of low-income peripheral neighbourhoods have been observed protecting and improving streets and parks in their neighbourhoods. People have defended public green areas from new residents who want to illegally occupy these spaces in order to build their houses. In order to avoid the invasion of public space, inhabitants have built playgrounds, paved streets, and maintained public places to benefit children and young people. Moreover, inhabitants have organized themselves in order to achieve the upgrading of public space with the help of local authorities, an important actor in the adequate and permanent development of public spaces.

Public space production and consumption in these contexts show people’s capacity to organise, reach consensus and work collectively for their urban environment. Figures 1 and 2 show that in low-income neighbourhoods there is a legitimate interest in public space transformation and improvement in order to construct a more integrated city. Public space improvement is regarded as part of the solution to social problems such as vandalism or social fragmentation that may occur in neighbourhoods. Furthermore, public space is also seen as an asset with educational and

Figure 1: The low-income populations build public space through solid collective participation in Xalapa, Mexico. (Source: Local residents).
social significance for the positive development of children and young people.

Privatized Public Space

However, from a different perspective, the urban populations with more economic power are building/developing new forms of urban space which promote privatization and fragmentation through the creation of closed residential neighbourhoods, protected by walls and gates, where only the inhabitants and members of the inhabitants’ community are allowed access. Moreover, shopping malls and international/multinational supermarkets combine with this new city growth, where public space is regarded only as a space for the traffic and therefore lacks a pleasant pedestrian environment. Privatization of public space through these new urban development leads us to reflect on the relationship between public and private space in our cities.

The promotion of private and individualistic values in contemporary society, and the attitudes and policies of city authorities in favour of private interests and actors, have been decisive factors in the configuration of 21st century public space. Nowadays, in most major Mexican cities there are well-off areas where shopping malls, restaurants, offices and luxury gated residential areas are being developed. Santa Fe, an area located in the south of Mexico City, symbolises the new values of contemporary public space. A public-private urbanism that seeks to break the city into fragments emerges in Santa Fe, isolating people and segregating social groups, enclosing each group in their own ghettos without public spaces and confronting them with their own environment. Santa Fe seems to be a walled city for the exclusive use of its cowardly and wealthy residents (Borja, 2003). Furthermore, in areas like this, public spending on infrastructure and services is also concentrated to the benefit of private investment/investors; this is in contrast
to the lack of investment and improvement of public spaces in low-income areas (see Figure 3).

Public space in these contemporary urban environments is at great risk. Lara (2007), in her research in Merida, Yucatan, argued that the configuration of urban space, strongly determined by economic interests, had brought about low-density land use, and the creation of inaccessible areas in cities due to physical barriers and gates where only residents or those with permission have access. Therefore, social and physical fragmentation has become a common characteristic of many Mexican cities. Since contemporary development is exclusive to some areas and particular groups, the lack of provision of urban services, green areas, and public spaces for the benefit of low-income areas and the city as whole is also very common. Moreover, Lara (2007) found that since neighbourhoods are gated and privatized, the city authorities also neglect these areas and fail in the provision of some public services (e.g. rubbish collection or public street lighting). As a result, the impoverishment of the urban space in cities is evident; Mexican cities have developed with corridors of shopping malls and private gated neighbourhoods in some privileged areas, described by Sorkin (1992: xi), as a “disaggregated patchwork of urban fabric [which] forms a bland, senseless environment.”

Public Space, Tradition and Identity

In the last few decades, public space in historic city centres has also received a lot of attention in most Mexican cities. Since the country has been strongly promoted as an attractive tourist destination, historic city centres play an important role in economic development. City centres have been transformed into spaces for tourism and retail, with the view that historic city centres are part of the urban heritage which should be preserved and revitalised in order to bring about economic revitalisation.
and regeneration. Although, some successful physical improvements and conservation strategies have been implemented in Mexico, these have been carried out to favour tourism and economic development, while local inhabitants, and social and symbolic identities that have characterized these urban spaces for many centuries, have been weakened.

Some interesting urban interventions can be observed: for example, in the renovation of Mexico city’s historic centre, a great deal of public space, such as streets, squares and parks, has been improved, together with the promotion of major development projects (hotels, restaurants, offices, housing). Considering that this central area was totally abandoned for many decades with serious problems such as crime, low property prices, invasion of public space by street vendors and cars, and with very low occupancy of housing, the regeneration strategies implemented in this area have led to successful urban revitalisation. However, integrated development frameworks need to be visualised, planned, designed and implemented by urban managers in order to find a successful means of urban renovation and regeneration (see Figure 4).

Public spaces and the urban townscape have been renewed in many historic city centres, but without any intervention in social and economic development for inhabitants and local businesses. This has given rise to revitalisation strategies with poor long-term sustainability. The case of the historic centre of the port-city of Veracruz is a good illustration of this. Here, renovation has taken place in public spaces and the facades of buildings, but there is a lack of urban, economic and social strategies to sustain physical renovation and revitalisation. There are still many areas with very low quality environments, characterised by abandoned properties, with many rundown properties.
buildings housing multiple families (patios de vecindad), and a total neglect for transport and mobility services. Moreover, the conservation or restoration of the interiors of buildings is not very high on the agenda.

Finally, the lack of interest and consensus among actors, agencies and government to establish long-term architectural, urban, social and economic strategies that trigger a holistic development process is evident. This situation leaves a high degree of uncertainty for viable renewal and revitalisation processes in historic city centres.

Environmental Revitalisation

When political willingness, economic and social support and legitimate benefits for the city and its citizens are present, urban projects are usually very successful. In the north of Mexico, the Paseo Santa Lucia (Saint Lucia’s promenade) in the city of Monterrey is a thriving case of public space development. Monterrey is the richest city in northern Mexico, and has a strong industrial base with a very strong economy. Its people are often characterized as enterprising and dynamic, and this is also reflected in the image of the city. It has a large public space known as the Macroplaza, which is currently the second largest plaza in the world after Tiananmen Square in China. It covers an area of 400,000 square metres, consisting of various monuments, smaller plazas and gardens.

In this context, Paseo Santa Lucia is an approximately three-kilometre linear park linking the historic centre with a former ‘fundidora,’ or steel foundry, which has been converted into an urban park. The Paseo is a canal along which pedestrian footpaths, fountains, green areas, public art, cultural spaces, and restaurants are located. Local residents and tourists can stroll along the promenade or take a boat from Parque Fundidora to the city centre and vice versa to enjoy the different features of this public space. Parque Fundidora was opened in 2001 and is also considered one of the largest public spaces in the country because it is a park covering 114 hectares where many recreational facilities, including an amusement park, museums and shops, are found within the metropolitan area of the city.

These new public spaces have been very successful in giving Monterrey a new face, for the enjoyment and socialisation of city inhabitants and visitors from all over the world. These examples represent urban places that have brought real environmental, social and economic benefits to the city and its inhabitants. Nowadays, international sport events, celebrations, meetings and trade fairs take place in Parque Fundidora and Paseo Santa Lucia. Paseo Santa Lucia has revitalised the urban environment of many neighbourhoods with green areas, new local businesses, cafés, restaurants and spaces for recreation and relaxation (see Figure 5).

Spaces of Fear and Insecurity

Mexican public space is full of contradictions: whilst in some urban areas worthwhile public spaces are encouraged and built, as seen in the previous case, in other areas, private actors and local authorities are promoting a privatised city, as with the development of closed residential compounds. Moreover, some cities are characterised by public spaces
full of violence and insecurity and a lack of social values. Ciudad Juarez, on the northern border, is a city where public space has lost its role as a social integrator and linker. This is an unhealthy urban environment, characterised by drug dealing and killings in public space, and where the murder of women has been a problem for almost a decade. In terms of public space improvement, local authorities have made efforts to improve and upgrade neighbourhoods, in order to create a better and safer physical environment, but these interventions have been insufficient and had little impact.

The causes of the unsafe urban environment...
in this city go beyond the poor quality of public space. Ciudad Juarez represents a passageway to the United States for many Mexican and Central American migrants who look for a better life in the “American dream”. In addition, the city is the hub of one of the most important drug cartels in the world – the Cartel de Juárez. As a result, the city and its urban environment are under constant threat. For this reason, social interaction, economic exchange, and collective activities in public space have significantly decreased. Inhabitants’ interactions in many neighbourhoods in the city are characterized by fear of crime and insecurity. Moreover, the low quality of the urban environment is a general feature, because public areas are now abandoned spaces which have turned into derelict land occupied by people considered undesirable and frightening to the general population.

To sum up, urban environments in this city are deserted and threatening. It could be said that public space in Ciudad Juarez is an example of what theoreticians have presented as the emergence of a hostile, unsafe and unhealthy public space, where the real significance of urban public places has been totally lost. Even worse is the fact that due to public policies against organized crime promoted by the Federal Government in the last few years, this situation is being replicated in many other cities in the country.

**Real Democracy and Pluralism**

All city dwellers have a right to a sustainable public space. In many urban neighbourhoods, residents are concerned about high quality public space, and consequently they struggle for their right to enjoy public spaces that promote a healthier urban environment within their communities. In this way, it is believed that a real understanding of the values and roles of public space for the benefit of urban communities, in accordance with more participatory and democratic processes, should lead to the improvement of urban environments in our cities.

In contrast to the improvement of Ciudad Juarez, the case of Ciudad Bicentenario in Metepec, Estado de México, is an important example of citizens participating to defend a great public space against the state authorities, who intended to sell the land to private investors to build a new commercial and financial centre, putting at risk more than 100 hectares accessible as public urban space and affecting the capacity of urban infrastructure available to the city. The citizens organized the defence and protection of this space through strong urban protests and the establishment of a social movement, called “Salvemos SEDAGRO” supported by the “Grupo Pro Reserva Natural Bicentenario” (a group in favour of the Bicentenary Nature Reserve).

The movement managed to make the authorities reconsider their plans, and instead of this public land being privatised, inhabitants achieved the planning of a park and public facilities for the city. In its first stage, the park opened in 2009 following an investment of 70 million pesos (approximately 6 million USD). The park includes extensive green areas, water features, running tracks, an environmental education centre, museum, library, sports and commercial areas, parking space, information points and medical centre, all with an environmental focus to promote the protection and conservation of the natural environment. Parque Bicentenario provides a good example
of citizens’ participation in the conservation of open urban spaces in Mexico (see Figure 6).

**Discussion**

There is a general tendency towards privatisation in most areas of modern life, and public space is no exception. In contemporary neoliberal capitalist societies, authorities seek to favour internal investment and present a positive urban image to international capital investors by offering images of urban order and modernity, envisioning and creating controlled and well-managed urban spaces, but often neglecting ordinary inhabitants, the needs of public space users and the aspirations of those who are less powerful.

In Mexico, even though some groups enjoy high-quality spaces with similar characteristics to those located in the urban environments of most developed countries, there are other groups who are deprived of this right within urban society. Social exclusion and inequalities that prevail in Mexican urban environments are an aspect that weakens social and human development, social inclusion, participation and access to a high-quality urban environment.

Moreover, public space processes have been affected by undemocratic political practices. In many neighbourhoods, spaces for local parks, playgrounds and other public facilities have been left at the mercy of corrupt leaders, authorities, politicians and many other individuals and groups who negotiate in exchange for private interests, political or economic power. The spaces allocated for public use are public properties legally managed by the authorities, however, different actors (inhabitants, governments and investors) speculate with these areas, neglecting their public status and their value for the social, environmental, and cultural development of urban communities, and promoting their privatisation to develop a more profitable city. Furthermore, a privatised city that only favours economic gains is characterised by physically fragmented urban places that only promote individualism and exclusion.
Fully participatory and collaborative city planning and design to maintain the balance between the different interests (public-private, economic-political, collective-individual) do not really exist in contemporary urban Mexico. Frequently, the resulting public space is strongly dominated and controlled by the actors with most economic and political power, to the point that these ride roughshod over the process and people’s desires. Citizens often have to organise themselves and struggle against government, investors and/or developers in order to defend their right to public space and eventually the right to a better and healthier urban environment. In future research, it is important to interview the actors involved in processes of transformation: residents, planners, urban managers, and other professionals, in order to determine peoples’ perceptions about power relations and community power. Moreover, appraisals through questionnaires and interviews with different users are important to find out their sentiments and opinions about the quality of the improved public spaces.

**Conclusion**

At present, the important question to ask is how to reconstruct public space in the Mexican city of today, overcoming the tendencies of privatisation of public space, the creation of environments of fear and abandonment, and social and political inequalities. Actors in charge of the management of our cities should make an effort to direct their public policies towards the values of social equity, identity, environmental quality, economic efficiency, political participation, real democracy and pluralism in city planning and design, and promote development that takes these aspects into account. Moreover, more than 75% of the Mexican population now lives in cities, yet poverty, insecurity, social and physical fragmentation, and low quality environments are the main characteristics of Mexican cities. Solving, or at least reducing, these contemporary problems by providing better housing environments, safe areas, education and employment opportunities, high quality streets, parks and green areas, and efficient public transport, in other words, a higher quality of life in cities, represents a real challenge for most cities in the 21st century.

**References**


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THROUGH THE EYES OF THE LEARNER:
A CRITICAL EVALUATION OF AN URBAN INDIAN SCHOOL

Smita Khan and Rajashree Kotharkar

Abstract
India, being the second most populated country in the world, a sizable school going population is the result of a positive and proactive response to the governmental efforts on basic education. This has catapulted the responsibility of schools and their environs in shaping young impressionable minds due to their sheer number. This study aims at exploring and investigating qualities and characteristics of an urban Indian school through critical post occupancy evaluation of the school environs through the eyes of the children. To initiate this study, a premier school of Nagpur city, exemplifying a typical urban school, was identified for a pilot study. The methodology encompassed interviewing the Principal, observation by the researchers and interaction with students to understand and critically analyze usage pattern by principal users of the school. The design of the tools for user response was devised keeping in mind the age of the students and their ability to communicate spatial experiences. The paper served as a fact-finding mission and in its outcomes led to an identification of the major variables of the spatial environs of schools. It brought to fore an understanding, which the mandatory prerequisites of school infrastructure lack in a humane vision that is so imperative to educational environments. It facilitated in pinpointing the lacunae existing in the National Curriculum Framework, which is a governmental guideline for all schools in India. In conclusion, the article emphasizes the urgency in the necessary ‘humanization’ of the schools to the happiness and contentment of the young who are nurtured within its spaces.

Keywords
Urban school environment, spatial attributes, student’s assessment, behavioral response, post occupancy evaluation.

Introduction: The Urban Indian School as a Pertinent Typology for an Evaluation Study
In the new millennium government efforts towards literacy has had a positive and proactive response especially in urban centers. India being the second most populated nation with a population of 1.2 billion, the responsibility of schools and their environs assumes great significance in the light of the sheer number of young impressionable minds that are being shaped by them. This paper aims at understanding such an impact through a study of school environs in India. Such an immensely potent study is lacking in the urban Indian context given the physical and spatial circumstances of majority of our schools: private as well as aided.
This study initiated in response to a felt need for a fact-finding mission to acquaint with the ground situation of typical urban schools in India. With this aim, a premier school of Nagpur city, exemplifying the above was identified. A critical post occupancy evaluation of school environs through the eyes of the principal users - the student - was devised and carried out as pilot survey.

It helped achieve an understanding of the vital issues of Indian schools; the process of education they adopt and the nature of teaching-learning activity. It assisted in acquainting with the essentials of a typical urban school environment such as its spatial pattern, the environment within and its architectural manifestation. Furthermore, this preliminary investigation aided in the identification of the many user related issues of school design and the problems faced in the discharge of its primary function, despite of the recommendations by the National Curriculum Framework of the Government of India. This ‘warm up’ exercise served as a springboard for a wide based inquiry to be initiated by the authors as part of a doctoral research on urban school environs in the Indian context.

To contextualize this issue of learning environs it is felt necessary to first acquaint with the evolution of the Indian education system: its underlying concepts, its mutation through the ages to times contemporary. This shall clarify the current thoughts on the issue of basic education and put into focus factors influencing contemporary school education.

**The Context of School Education in India**

India, an ancient land and a geographically vast country, is home to a multitude of cultural variations. A deep rooted spiritual orientation continues to be a living tradition with its teeming billions despite globalization and the ‘flattening effect’ (Friedman, 2006) of a shrinking world. Essentially then contradictions are writ large in all spheres of human activity and one that concerns this paper: the essential basic school education and learning environs are also not spared the dichotomy of the traditional confronting the modern.

**A Brief Historic Recall**

The ancient Indians equated knowledge with ‘that which liberated’ (Joshi, 2005, pp. 27) The flowering of the great Indian civilization and its spiritual legacy is the fruit of a system of teaching and learning by oral traditions of recitations and rigorous practice under the watchful eyes of the Guru in his hermitage situated in the midst of Nature.

The coming of the colonial rule disrupted this indigenous method of knowledge transfer. The British exploited the system of education to serve their need to produce indigenous interpreters. Western science and logic, through English was the focus of colonial education (Halsall, 1998). The classroom oriented towards the teacher became an essential learning environment.

Independence after 200 years of servitude saw India as an economically devastated nation, making self-reliance, austerity and a return to values Indian a dire necessity. ‘The Indian conception of Education’ can be summarized in the challenges that lay before the newly independent nation.

- The need for creation of a capable human resource leading to an advocacy for vocational training in one’s own mother tongue; this was the concept of ‘Buniyadi Shiksha’ or basic
education proposed by Mahatma Gandhi, the proponent of the non-violent struggle for freedom (Education as per Mahatma Gandhi).

- India’s cultural, linguistic and religious diversity coupled with its vast geographic extent made it imperative to weave this complexity into a consistent fabric by making necessary the habit of respecting others feelings so that people of different religions, faiths, occupations and attainments who constituted the society may live in peace and amity observed Dr. C. Rajagopalachari (Panda, 1987).

- The many visionaries; philosophers and thinkers, envisaged the goal of education to be a holistic development of an individual. Vivekananda (as cited in Roy, 2001, para 5), J.Krishnamurti (Forbes, 1997) and Tagore (Tagore, 1985) viewed the central concern of education as ‘flowering’ of the human mind so as to make human life capable of the immeasurable rather than limit it to the mundane measurable. The dynamism and the scientific attitude of the West had to be combined with the spirituality of India for the development of a balanced nation.

- Schools established by Krishnamurti and Tagore placed great emphasis on the physical environments. The warm and sunny climate of tropical India made it possible to hold classes in the open air under the trees encouraging a spontaneous appreciation of the fluidity of the plant and animal kingdom and seasonal changes. Tagore argued for a humane educational system that was inclusive and non-authoritative (O’Connell, 2003).

The Current Scenario of Indian School Education: The Policy End

With all good intentions, the Government of India, in order to realize a well balanced, integrated and adequate system of national education capable of making a powerful contribution to all aspects of national life, set up an Education Commission and the NCERT (National Council for Educational Research and Training) came into as the apex resource organization (www.ncert.nic). It constituted the National Curriculum Framework (NCF 2005) with guidelines for school education throughout India. It makes reference to the thoughts of Gandhi and Tagore on education (Education Commission 1964-66).

Dr. Kothari acknowledging the contribution of education in enriching the material quality of life, emphasised its concern with the ‘inner content’ of one’s life. The educational process needs to be enjoyable, exciting and inspiring adventure (as cited by Mahanti, para 11).

In its ‘aims of education’, the NCF 2005 addresses many soft issues such as sensitivity to others, learning to learn, willingness to unlearn and relearn, flexibility and creativity, democratic participation, school as a social space, respect for dignity and human rights, processes of constructing knowledge, appreciation of beauty as an integral part of life and enhancement of creative expressions of the children. While weaving through these most acknowledged issues of school education, the recommendations on nature of physical environs seem inadequate, as they are restricted to merely recommending a flexible arrangement of the classroom furniture and adopting region specific architecture instead of standardized systems!

A study of the learning environs of schools shows the understated importance of physical environs.
**Contemporary Urban Indian School: The Physical Environs End**

Indian schools face some special challenges in terms of their environments:

1- Schools are large in size, since rules do not restrict the total intake of students if physical infrastructure is commensurate with prescribed norms.

2- For concise accommodation, most often the spatial configuration is tightly fitted together. Although most Central Board of Secondary Education (CBSE) schools are on city outskirts, a closely fitted plan makes economic building. Most urban schools have no option, but to be crammed up.

3- This configuration despoils the most crucial space of the school: the classroom. Designed to accommodate the precise intake, they have no breathing space. Thus, flexibility of furniture arrangement is ruled out in most cases.

4- Pedagogy in most schools is a one-way system. Teacher speaks; students listen. Although, curriculum, especially of science is encouraged through small practical experiments, use of laboratories or self-exploration is seldom encouraged.

5- Classrooms crammed with students, make a claustrophobic atmosphere especially as children grow in older classes. These are the most matter-of–fact spaces in the entire school

6- Norms making mandatory co-curricular and physical activities help diffuse tension. The activity is carried out without any sensitivity towards the nature of informal activity; the regimental environments do not change even if it is a music or arts and crafts space.

7- Worst still many state government affiliated schools do not even possess a playground: that most essential of school spaces.

8- Most school buildings, even of the most successful schools, are very institutionalized and sterile in their visual feel. “The way a school is designed to work reflects social ideas about institutions and the education these institutions are creating to further” stated Grosvenor, Lawn and Rousmaniere, (as cited in Sanoff, 2009, pp.10). This statement is a close reflection of the Indian school system.

**The Changing Ground Situation in India: Wrongly Headed?**

In sixty years since independence, the magnanimous view of education that tradition withheld is undergoing a sea change. The aspirations of the fast prospering middle class in India are centered on acquisition of ‘appropriate’ education for their children. To succeed at all costs is the parental thrust on the child; the single-track agenda is academic excellence.

The contemporary culture of extreme materialism encourages and demands that the student be oriented towards a job and physical security. The educational effort is now directed towards a standardized, time bound program of study with too much emphasis on examinations and procuring of degrees. Globalization and the need to connect has once again catapulted English as the most favored medium of instruction.

The schools are astute in their response. The billboards and hoardings advertising new schools that are mushrooming around the city are a pointer towards this tendency and tell
some compelling facts:
i) Contemporary schools advertise e-facilities as the premium plank.

ii) To make an all rounder ‘winner’ is the coveted goal of most schools. The pressure to excel in all that he/she lays his hands on is thus tremendous (see figure 1).

iii) Tuitions are an accepted norm. Tuitions leave little or no time for anything except studies, making stress the mainstay of the child’s life.

Therefore, all consuming is this passion that society seems notoriously blind to all other aspects of education discussed so far. And, in addition, this trend is not without drawbacks.

Efforts of the NCF 2005 to ‘unburden’ the child seem only cursory given the societal pressures to always be the ‘winner.’ There seems to be no respite to this unenviable situation.

**Packaging Educational Spaces: A Market Strategy**

It is not that no thought is being given to the school buildings. The sterility of the older schools is being met with some very ‘innovative’ and ‘amusing’ responses. Contemporary school buildings have reacted by ‘packaging’ the school buildings in the latest fashionable trends. The following pictures illustrate the misconception or guile with which the schools

Figure 1: An advertisement for a school (Source: Authors).
operate:

“The way in which we approach the planning, design, and ultimately our overall perception of learning environs makes powerful statements about how we view education. How school buildings are designed tells us much about how teaching and learning occur” (Salama, 2009, pp.35).

These ‘fashion statements’ follow the same routine pattern of education. Nothing has transformed in terms of a conducive teaching learning environ.

“Widespread misconceptions reinforce the view that the quality of the school building has no impact on the academic performance. Consequently, a gap exists between the educator’s view of improving quality and the process of planning schools” (Sanoff, 2009, pp.10).

This is the precise reason for the underlying apathy towards buildings. As long as they satisfy the functional aspect, even in the barest minimum manner.

“In education, as in other institutional systems decisions about school facilities tend to be made by a few people who are not direct building users, often ignoring the direct involvement of teachers and students” (Sanoff, 2009, pp.9).

Brophy argues that, “if students experience the classroom as a supportive place where there is a sense of belonging, they will tend to participate more fully in the process of learning’ (as cited in Sanoff, 2009, pp.11).

The Understated Importance of School Built Spaces in the Indian Context

“Much of architecture affects people from beyond the focus of awareness. People are not sure what it is about a building or room that affects them, nor are they able to express how they feel in different surroundings” (Sommer, 2007, pp.212).
The Pilot Study: Aim and Methodology

The aim of this research paper is to explore and investigate qualities and characteristics of the built environments of a typical urban Indian school. It aims at critically evaluating the educational environments through the eyes of the learners, who are the major users of the school environs. This study also helped identify various design parameters of the school environs that affect student’s behavior.

The methodology initiated by the selection of a well-established school with a reputation for academic excellence in Nagpur city for a pilot survey. ‘Modern School’ is CBSE affiliated, co-educational and with a student strength of 2233 in academic year 2010-11 for standards I to X. Boys exceed in number: 1302 against 931 girls. The school has 98 teachers on roll. The school occupies approximately 18200 m2 /4.5 acres of land on the northern outskirts of the city. Students and faculty commute by school buses. A regular school day is 6 hours long with two recess breaks of 10 and 20 minutes each.

The methodology adopted a multipronged approach to assess the quality of environments and their impact on the students. The tools used are personal interviews, analysis of the architectural design, direct observation, photo documentation and assessment of the environments by the students. The sample size for this study was 250 students in the age group of 13-17 years. In addition, the interview with the Principal and the architect were discussion oriented.

Analysis and Observation

The analysis and observation focused on psychological factors and physical design while critically analyzing the student’s responses. Following is a sequential discussion on the same:

Psychological Consequences of the Current Scenario of School Education.

The Principal, in a personal interview, acknowledged the changing behavioral trends that are very obvious. Students are getting very aggressive and tend towards being destructive. Reasoning points to the bottling up of excess energies, which get no respite due to the school-tuition-homework routine. The innocent mischief of the past is fast converting into wanton vandalism. There is no sense of a quiet activity grouping in the building, incorporation in design of aspects such as user hierarchy, visual connectivity, flexibility of classroom arrangements, child scale, sensitive use of materials and structure- architectural expression relationship.

Direct observation supported by photo documentation facilitated comparison of existing situation with the student’s observation and response to the same.

Assessment tools for students were devised keeping in mind their age and ability to communicate spatial experiences; which is difficult task. To make it an enjoyable activity and thus to get involved responses, the data sheet was designed as, ‘school experience’ and ‘school spaces’. It was presented as a creative exercise with freedom to express as they wished to: sketch, draw or write.
fore bearing or sensitivity towards the romantic. Along with this is the tendency to reject what they understand as ‘authority.’ This leads to disrespect towards teachers. The ‘consumerist culture of plenty’, the single child syndrome, reduced parental attention due to increase in working mothers and the tremendous pressure to excel is taking its toll on the young minds. In conclusion, she mentioned the installation of CCTV cameras across the school spaces: “When the students were informed about this, it called for restrain from vandalism. Since then there is reduced violent and unnecessary harm to the property.”

Identification and Analysis of the Core Design Attributes:
This was done through architects drawings and photo documentation of the built spaces (see Table 1).

Figurative Spatial Pattern of the School
The school sits on a site of approximately 4.5 acres. Its spatial pattern is introvert and consists of a semi enclosed rectilinear space onto which the school spaces overlook. Picture 4 shows the distribution of positive-negative spaces and activity areas. Its consistent three floors give the school building a massive and monotonous character. The section addresses graphically

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<td>1.2 Canteen</td>
<td>ii) Usage Pattern: Flexibility</td>
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<td>Enclosed open</td>
<td>2.1 Assembly</td>
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<td>Transitional</td>
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<td>3.2 Corridors</td>
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<td>Indoor Spaces</td>
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ANALYSIS FOR SPACES IN BOLD ONLY ARE INCLUDED IN THIS PAPER

Table 1: Analysis of built environments of sample school (Source: Authors).
the issue of scale.

**Critical Analysis of Learning Environments based on Student Responses**

Student responses to questions regarding their use of identified school spaces yielded an insight into the use and perception of their learning environments. The following critique is based on a critical analysis of students’ responses and their co-relation with the above identified ‘core design attributes’.

**Critique:**

1. It is mandatory for a school to have a playground for a CBSE affiliation.
2- Playing out of doors is listed as one of the most liked activity.

3- Located at the outer end of the school building, the playground is a huge space with matter-of-fact facilities for various sports (see Figure 6).

4- The only play equipment for the primary school kids occupies linear space at one extreme end. It has no sense of place. It almost feels as if it is there because of compulsion rather than out of concern for the small kids. There is need for a cozy casual and friendly enclosure for this activity.

5- There is need for plantation at the periphery of the playfields. This shall add a sense of scale to the otherwise untended look of the space. It shall also humanize and visually soften the ground scape. This is one space that can give the healing touch of natural green, as, in the overall scheme of the school, there is no other place for its incorporation.

Critique:
1- Students' responses point out the canteen as one of the features that seemingly brightened their day at school but the much-loved experience has been marred due to planning apathy. The pleasure of the activity is negated due to physical discomfort.

2- The presence of a drain flowing close by spoils the atmosphere and makes it unhygienic.
3- There is no thought given to using of the same space by big and small children. The space for queuing up is less limited, resulting in near stampede conditions that the students have so well depicted in their sketches (see figure 8).

4- Located in the outer margin of the school premises, it has no visual connectivity with the rest of the school.

Critique:
1- In its spatial pattern, it is a rectilinear space, enclosed on all 4 sides by the 3 storey tall school building. It is connected to the outer open space by several small/narrow exits. Its liberal dimensions make it feel ‘open’ and visually non-claustrophobic, when occupancy is at a minimum. This plan pattern also provides for visual connectivity to all corners of the large school. Students have remarked that they like standing in the corridors as there is feeling of inclusiveness and security.

2- This is the central space around which all activities of the school revolve., it is a multiuse space. The major activity is the daily prayer assembly. When attendance is full (approximately 2500 students) on regular school days, it becomes congested, as is reported by many students. Long duration and exposure to the hot sun add to the physical discomfort. This makes assembly a cumbersome activity, disliked by many students. Children have reported bad acoustics and inability to be part of the going on-s on the stage at the far end. The year round warm climate and harsh sun makes some students to faint, indicating that proper air circulation may be an issue.

Activities such as drills, yoga sessions, debate and elocution etc. are part of the usage of this ground. It has 2 basketball courts and the entire space is used by students to play in the recess. In multiuse, the basketball court has a nuisance value as the ball hits others in the crowded ground during the recess.

A pertinent design issue to be addressed is the availability of a single uninterrupted space for a co-educational school. To a specific question asked on this count, many girls have responded that boys occupy most of the assembly ground during the recess and as their games are either too rough or involve balls, many girls do not find this space very conducive to their kind of activity, the result: girls continue using classroom space even during recess breaks. Gender sensitivity is an issue school designing must address. Also, the use of the same space by big and small children: there is no hierarchy in the space design.

This space is also host to the biannual concert. The problem of stage visibility is solved by erecting projection screens intermittently. Large schools have large number of guests, so such a large flexible use space becomes a necessity.

3- The character of spatial environment is
largely shaped by the nature of the form that defines it. The school building is very severe in its presentation. Arches articulate each floor. They are repetitive without any respite leading to a visual monotony and sterility. Made as a flimsy screen in RCC, the presentation of the arch, which is a fundamental building component, seems false. The plastered and coloured arcades appear regimented and the ambience is devoid of any warmth since the entire ground is cemented and plantations almost nil. A sense of scale that is an important design prerequisite for a school design is completely missing.

Visual relief and a sense of comfort is denied in this most vital and central space of the school: the one that students have overwhelmingly expressed their love for because it is here that they ‘can play and be free’. Day (2004, pp.218) stated that, “hardness has a hardening effect. Aggressive or dishonest surroundings do them harm. Rigid forms and spaces have an entrapping, sterilizing effect on development, fostering rigid-category thinking in place of mobile openness.”

Critique:
1- These connecting spatial elements are the most happening spaces in a school (see figure 11). Opening up strategically for interactions could enhance and soften the linearity of corridors.

2- The visual feel is too stark; needs enlivening.

3- By virtue of the plan configuration, visual connectivity has been achieved. A greatly appreciated feature of the design!
Critique:
1- The students go out of their way to give credit to their teachers but reiterate that classes are boring. Book based learning needs supplementation with a visual appeal. Classroom layouts need to be flexible and students need to feel ‘connected’ to the process of teaching and learning. (see figure 13).

2- The classroom spaces need enlivening so that the element of ‘pride’ of one’s space of learning can bring about the need to ‘care’ for it. Presently the anonymity and sterility of the classroom atmosphere makes it game for venting out excess energies.

3- A ‘sense of belonging’ needs nurturing; CCTV cameras antagonize. Some vandalism has definitely been curbed; but the tendency to vandalize shall dissolve only if a sense of belonging is nurtured.

4- Physical comfort is a prerequisite for concentration. Thermal comfort in the year round warm and dry climate of Nagpur necessitates artificial ventilation by fans. Vandalism as well as regular maintenance is a major issue, leading to the very vocal response on part of the students. Ergonomics is most neglected. Furniture is in a constant state of disrepair. Supporting facilities like lockers etc., is not provided. It is bare minimum at which the school functions.

Figure 13: Student sketch showing the seating layout in a classroom (Source: Authors).

Figure 14: School washrooms and the query (Source: Authors).

Critique:
1- Without exception, all responses on the school washrooms were strongly in the negative direction: lack of maintenance, broken equipment, unhygienic and worst still the unavailability of water.

This has resulted in many students stating that they have ‘learnt’ the ‘art of control’. In a 6 hour school day plus 2 hours of commuting time this is a highly undesirable practice.

2- Maintenance and frequent replacement of equipment due to wanton vandalism are causes behind this pathetic situation.

3- The essential attitude on the sharing and caring for a public facility is a major learning.
The school being the primary imparter of basic education needs to face this challenge and make it an essential part of the learning process.

4. The washroom facility is not commensurate in its size to the number of users, also given the restricted time of the two recesses. Sketch in Figure 15 humorously portrays the situation.

**Critical Analysis of Behavioral Aspects and Space Design:**

This study includes the aspects of gender and vandalism.

**Gender issue and spaces:**

Question: If you are a boy, express your observation of how girls spend their recess time and vice versa.

Critique:

Co-educational schools are very popular in India. However, the student’s responses indicate how the design for such schools is far from being inclusive. In response to the question asked, the girls expressed dissatisfaction at the way boys conduct themselves, “they eat each others lunch very horribly, make too much noise, constantly fight and play with water bottles, broken furniture and sticks even when equipment is available.” The common open space is the bone of contention. Mostly declared ‘boy’s territory’ the girls use classrooms for their activities. The boys observation is that, “girls sit and sing boring songs, mess up furniture arrangement, never re-arrange and spill food all over the place.” Corridors are declared by both girls and boys as a ‘rocking space’.

Architects need to be more sensitive in allocation of spaces for gender specific inclinations. It is not that girls do not want to play, it is just that the chaos on the single space grounds is overwhelming, resulting in classrooms being their recluse. This issue is pertinent from point of view of the ratio of boys to girls.
There is a need to break the current undesirable behavioral pattern, of girls tending to sit around and gossiping, through design of spaces, rather than accommodating the behavior.

It is also an economic compulsion. High cost of land in urban centers makes large multi-use outdoor spaces more practical. The fallout is a compromise. Nevertheless, innovative design solutions can resolve this issue.

Wanton vandalism issue:
Question: What activities take place in the corridors and the classrooms during recess time?

Critique:
With specific reference to the interview with the Principal, students’ responses are alarming. They point to the growing instances of indiscipline and wanton vandalism. Dis-satisfaction at the ‘clandestine’ monitoring by CCTV cameras is reflected in their sketches and writings.

A boy writes, “do you know that our classroom is very bad, it is very dusty, benches are half broken and nails are coming out... we broke tables, chairs and regulators of fans etc.... our class has only one colour - white.” Many describe classroom learning as boring and want to get ‘punishment’ so that they get to stand outside in the corridor and this gets still better when many are punished!! There is a general dislike of ‘discipline’ (see figure 17).

Figure 17: A satirical sketch by a student enjoying punishment in the corridor (Source: Authors).
This is a manifestation of the bottling up of their immense energies.

1. The classroom learning that is mostly single dimensioned: teacher speak: child listen makes punishment to stand in corridor more enticing.

2. The school recesses not having enough time to eat lunch and play.

3. Standards 8th through 12th are heavily stressed due to impending school leaving exams. Thus after school hours are engaged by tuitions, and then homework takes over. The trauma these children undergo is unjustified.

According to Christopher Day, “Young people specially, need buildings and places welcoming to the soul: places that aren’t exploitive, places that, in the way they are conceived, planned and built show love—that most needed and least supplied quality—that can transform the social delinquent into a crusading rebel....Easy? Obvious ? Then why doesn’t it happen more often?” (Day C, 2004, pp.224).

With research pointing to environments playing a role in the behavior of the users and the students expressing dis-satisfaction of the school ambience in whichever manner was possible for them to express. It is evident that the sterile, uninspiring atmosphere of the school environs do not embrace the students with warmth and a sense of belonging is missing towards school and its built environments. The school environs themselves could proactively contribute to an informal involved learning by becoming a 3-D learning space. This would go a long way in instilling a sense of belonging towards ‘their own’ live working model! (Newton C, et al 2009).

To the already tight cumbersome school schedule, the restless, exploratory nature of the years under study and the excess surge of energy they are experiencing are only magnified by the harshness of the insensitive built surroundings. To de-stress the students, environments need to provide succor, be inclusive and promote compassion and warmth within oneself while providing an opportunity for exploratory learning.

**Discussion**

- The response of students exercise to this creative was overwhelming indicating the strong need to communicate on such issues.
- That the environs lack on many essential fronts is acknowledged by the ‘cleanliness and beautification’ activities that overtake just before the school inspection day. Students have succinctly summarized this queer happening in their sketches!!
- Discussing on the critical issue of a responsive educational environment, Dr. Salama writes, “While it was said several decades ago that a good teacher can teach anywhere, a growing body of knowledge- derived from knowledge on ‘evidence based design’ suggests a direct correlation between the physical aspects of the learning environment, teaching process and learning outcomes” (Salama, 2009, pp.5).

This evaluation study points out much the same. The environments are a ‘matter-of-fact’ creation at the school authorities end; humanizing at the student’s end is missing due to lack of adequate encouragement and infrastructural support. It is bare minimum at
which the school functions. It is a very Indian concept that to achieve one’s goal in life one must excel despite circumstances, physical environs thus are not given due importance. This comparison to the ‘class under the tree’ where the most profound spiritual knowledge was acquired at the feet of the Guru in ‘bare’ conditions is misconstrued at best.

At most times this is passed of as the function of economics of running a large school. The subtle influence exerted by the school surrounds on the growing minds is over simplified and ignored at best. The pertinence of sensitive environs for fostering humaneness in the growing minds is thus overlooked. Yet, the harm in the long run is detrimental.

“teenagers, though few admit it, crave inspiration...” (Day, 2004, pp.227)

Despite their frank assessment of the many lacunae of their school environ, many students are very magnanimous and loving in their outlook towards their school ‘of many years’. “The school is irresponsible in many matters but it is one of the finest schools in Nagpur” signs off a 15 year old boy. Many more students have concluded similarly!!

The affection the students shower on their alma mater makes the issue of the rather non-responsive environments even more pertinent. It is an urgent need to transform them for they house within their walls such sensitive souls. The situation does hurt them, but they have no control. The authorities guiding the process of education in India, the school managements and the community of architects have to be more sensitive and proactive in their approach to the built environs. Children are the principal users of the educational spaces and their psychological needs must get a rightful place in the National Educational Framework.(NCF2005)

“there is a meaningful coincidence between the aesthetically satisfying and the physically healthy. What nourishes the soul nourishes the body”. (Day, 2004, pp.21)

The spiritually inclined Indian society shows capability of deep reflection on issues of pertinence. Education being an important one, one would expect then the same prudence in matters concerning the built environs within which such magnanimous thoughts shall be nourished and inculcated into tender young minds. The lack of understanding of and the inability to acknowledge the relationship between the quality of built environs and the subtle yet powerful influence it exerts on the growing minds thus seem a strange missing link!

This research shall endeavor to bridge the schism between ‘academic performance’ and ‘flowering’ of the humane sensitivities through the essential medium of the built environment.

**Conclusion**

This research served positively its intention as a fact-finding mission for acquainting the authors with the ground situation of a typical urban Indian school. Alongside the investigations, many pertinent concerns also came to fore.

The correct and successful discharge of basic education is essential to the enrichment of the national human resource. The stakeholders in this endeavor include not only the government,
but also the society at large including the schools, the instruments imparting education, the parents who can be the major pressure group, the architects designing and defining the crucibles and the researchers whose insights can assist in defining the essentials of a conducive and humane setting for the worthy activity of educating the young. For reforms regarding environs for learning to initiate, there is need to enlighten the stakeholders at large to the role of built environs and their deep influence in shaping the young minds holistically.

The key role that built environments play on the developing minds has been underestimated given the brief and cursory nature of directions given by the National Curriculum Framework (NCF 2005) to the schools. The policy framework needs inclusive and well-integrated inputs from researchers and architectural practitioners to ensure positive and emphatic recommendations on the nature of physical environs of the school. These should translate into prerequisites for affiliation to ensure implementation.

In the quest for academic excellence, schools are lopsided and indifferent to the issue of conducive environs and parents unaware of the long-term harm. The pilot study conducted in the school exposed the gap between the user’s evaluation of their learning environs and the physical design of the school. It revealed the absence of the many child centric aspects that make the environs inclusive, comfortable and nurture a sense of belonging in the students. The result is the users having to negotiate with their environs while resolving their needs.

The study brought forth the lack of communication on this vital issue. It highlighted how the evaluation of spaces by the major users, the students, is never a matter of consideration at all levels: from policy planning to actual design. There is a total absence of design guidelines; both at the academic level as well as at the practitioner’s end.

The paper highlights the urgency of the matter and emphasizes the necessary humanization of the schools to the happiness and contentment of the young who are nurtured within its spaces. It opened up an unexplored direction and created grounds for doctoral research by the authors on school environs in the Indian context.

References


http://www.vigyanprasar.gov.in/scientists/dkothari.htm


www.ncert.nic

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SUSTAINABLE URBAN LANDSCAPE: AN APPROACH FOR ASSESSING AND APPROPRIATING INDICATORS

Ahmed Mohamed Amin

Abstract
The impact of development on its context is considered a key issue that governs the discussion and understanding of sustainability. For the reason, that ethics of sustainability are based on developing with no or less negative impacts on the contextual environment despite its urban scale whether limited or extended. This describes types of development that increase the good impacts on the tangible and intangible aspects of the built environment. Thus, achieving sustainability is no more a choice but it is a must especially, in an environment suffering from a lot of threats and stresses that affect all aspects of life; socially, economically, environmentally and also affect the beauty and aesthetics of urban fabrics. Assessing sustainability, the applied indicators and ways of assessment are all-important concerns for urban sustainability discourses. Especially in such sensitive interacting domains as landscape, that links nature with the built environment. Approaching these concerns has a great deal when enhancing our environment aiming at better urban life containers. This paper aims at investigating the issue of sustainable urban landscape assessment through discussing the hue of indicators, their ways of classification, the criteria of selection and stating the variety of methods in which they can be assessed. Finally, it appropriates an approach for stating and assessing urban landscape sustainability indicators, which evaluates their both qualitative and quantitative value upon performance scale.

Keywords
Sustainable urban landscape, sustainability assessment, sustainability indicators.

Introduction
Recently, sustainability has occupied a prominent but contested place on the public agenda. While few question the fundamental idea that human life on Earth must ultimately be sustainable, the precise definition of this term – especially in urban landscape - remains subject to deep disagreement. Therefore, there is a great need for more specific frameworks for interpreting and implementing urban landscape sustainability. Thus, sustainability in urban landscape has become an important topic because of perceptions of environmental degradation. However, it has also become salient because people have with the quality of life in their communities (Miller, 2007), (Soures & Quentella, 2008). Faced with diverse and sometimes contradictory goals, many communities have turned to indicators of urban landscape sustainability as an approach to establishing a more specific definition and implementation that are of importance in their
context. A key question arises: “How does one define the set of indicators? And also what are the measures to be used?”

**Objective**

The objective of this paper is to appropriate an approach for investigating and quantifying assessment of sustainability indicators in site landscaping processes. The problem concerning this discourse is the complexity and variety of the criteria that can act as a set of indicators and the qualitative aspects that are related to the majority of these criteria. Another important concern is the nature of measurements and how to fit them empirically with landscape designers. These attitudes that often prefer to deal with simple figures and/or charts rather than complex calculations.

This objective is achieved by discussing major discourses as sustainability definition, approaches and the nature of this term in urban context. This led to highlight sustainable landscape as system and subsystem, figure out the set of criteria ruling such a system and clarify the nature of relevant indicators. This is finally concluded by an approach for adapting and combining measurements for these indicators in the form of an index for quantifying sustainable landscape system.

**Sustainability in the Context of Urban Landscape**

The revolution of environmental awareness makes sustainability the theme of our times (IUCN, 1997). Hence, the environmental problems such as biodiversity loss, ecosystem degradation, landscape fragmentation, climate change and urban heat islands are already exist and have a great stress upon the natural and built environment. Urbanization is often considered the cause for all these problems. The relation between urbanization and sustainability is still contradicting throughout the recent discussions of interest in sustainability. There are different thoughts trying to configure this relation, some consider urbanization is vital to regional and global sustainability, whereas others regard urban and sustainability as an oxymoron (Wu, 2010), (Thompson & Sorvig, 2008).

Logically speaking, if our cities are unsustainable, urban landscape should be part of the solution to regional and global sustainability problems (Benson & Roe, 2007). The concept of sustainability in association with urbanization and landscape includes both technical aspects such as energy saving, reusing material, environmental management or ecology and non-technical aspects like social behavior and spatial organization. This is to insure that urban sustainability encompasses more than ecologic technology and other quantifiable aspects. From design point of view landscape sustainability has to be approached holistically. This insures that the technological side of sustainability should be considered as an accepted standard and a self-evident part of the project requirements rather than a desired ideal (Christianease & Salweski, 2009).

Urban landscape planning and design should be understood as a multidimensional and multipurpose managed change of the natural and built environment, also, as a cornerstone for sustainable cities. Thus, it influences the production of quality spaces, urban patterns, support of environmentally sensitive
development and promotion of participatory processes to allow citizens awareness and involvement (Rosales, 2010). It can be stated that, urban sustainability is fundamentally the sustainability of the urban landscape as a whole (Claudia & Kristin, 2009), so Indicators must highlight the following concerns:

- The process to measure urban landscape sustainability.
- The type of metrics that can be used as urban sustainability indicators.
- The landscape models that capture and project sustainability trajectories in response to environmental, economic, social changes? (Wu, 2010).

**Landscape Sustainability: Discourses and Dimensions**

‘Sustainable landscapes’ commonly describes landscapes that support environmental quality and conservation of natural resources. A well-designed sustainable landscape reflects a high level of self-sufficiency. Once established, it should grow and mature virtually on its own as if nature had planted it (Benson & Roe, 2007). Sustainable landscape should emphasize critical issues and concerns such as:

- **Aesthetic:**
  Although sustainable landscapes may appear more “natural” and less manicured, they still rely on basic principles to create a visually appealing combination of plants and materials. Aesthetic principles including accent, contrast, harmony, repetition and unity ensure the design is attractive, visually compatible and has a “sense of fit” with the context (see Figure 1).

- **Functional:**
  This dictates whether the design will be usable and will meet certain health and safety criteria, Figure 2. In addition, Sustainable landscape has to elaborate other important factors such as cost effectiveness and maintainability. These are strongly connected with functional aspect and depends on the appropriate plants and raw materials.
materials selection, the compatibility between use and maintaining process, the location and also the ratio between soft and hard elements (Calkins, 2009; Vanderzen & Rodie, 2008).

**Environmental:**
This focuses on several concerns such as enhancing landscape microclimate, increase biodiversity and maximizes reuse of resources. One of the major environmental concerns is that of using plants that provide habitat as well as aesthetic value. Moreover, resources can be reduced and waste can be minimized by choosing the correct plants and their locations (Smith, Clayden & Dunnett, 2008). Maximizing and reusing resources have recently received notable attention in the form of recycling. Effective sustainable design not only incorporates recycled materials, but also addresses how communities can recycle for the good of their landscapes (Rodie, 2010). Sustainable urban landscape should also address the concerns of sociability with its variant qualities such as diversity, cooperation, intimacy and sense of friendly spaces (Claudia & Kristin, 2009). However, even if the mentioned discourses are identified as urban landscape sustainability indicators or qualities, their use has been limited to their specific areas (Rosales, 2010).

**A self-organized landscape as a conceptual frame for creating indicators**
This can be defined by a setting that consists of a finitude of systems that expand and transform according to the objective of its site conditions. The concept of self-organization when is referred to urban landscape is inundated with diversity and temporality. The indeterminate, though site-specific condition, offers a shift from a modality to a notion of an urban landscape that is dynamic (Monacella, 2004).

The definition of the landscape as morphogenesis enables a landscape to be reconsidered as continually shifting and emerging phenomena. Understanding urban landscape settings within these conceptual approaches is of great importance when aiming to crystallize a set of indicators. This should clarify the recognition of flexibility and multidisciplinary for every landscape setting and reflecting this dynamism as a frame for creating indicators.

**Landscape setting as a merge of different system qualities**
Understanding the landscape setting as a system is very important for identifying relations and aspects of sustainability, therefore deducing indicators for assessing it. The site landscaping patches do contain one of the
following systems:

• Static systems that do not interact with their environment and do not change such as rocks.
• Metabolic systems that require a throughput of energy, matter such as waterfalls.
• Self-supporting systems that have the ability to secure necessary resources such as simple organisms.
• Selective systems that respond selectively to environmental challenges such as plants.
• Protective systems that can protect themselves from adverse influences.
• Self-organizing systems that can change their structure to adapt to changes in their environment such as plants or human activities.
• None isolated systems that modify their behavior in response to the presence and activities of other systems.
• Self-reproducing systems that can reproduce systems of their own kind such as culture patterns and systems.
• Sentient systems that can experience pain, stress, emotions and so on such as humans.
• Conscious systems that can reflect their actions and subsequent impacts (Bossel, 1999).

These systems can be classified whether they are surface systems that can be sensed visually or core systems, which need a specific type of deep investigation to cover their property (see Figure 3).

Accordingly, each site is dependent on its landscape systems and defines a certain situation. The capacity of typical situations to hold together heterogeneous elements in a specific site and also the capacity to give them a primary common meaning is an important criterion of the basic humanity of urban space. (Thompson & Sorvig, 2008)

Situation, despite its openness, is a useful term to describe urban landscape setting because the landscape domain does not consist of isolated categories, but rather of a mixture of themes, programs, typologies, contexts and methods (kavaliauska, 2007).

Sustainable urban landscape design requires concerning about and designing landscape situations in a thorough and precise, yet creative and daring way. It is necessary that the urban landscape designer concentrate not
only on the spatial and programmatic design, but also on the process of implementation. The process according to which a design vision is implemented also needs to be designed and this is all should be reflected when considering the discourse of assessment and deducting relevant indicators (Christianease & Salweski, 2009).

The Purpose of Landscape Sustainability Assessment

Assessing sustainability becomes more important when striving for enhanced urban landscape environments. One way of evaluating the outcome of action is using sustainability indicators (Hales, 2009). Indicators arise from values as one measures what he cares about and also create values as one cares about what he measures. The main feature of indicators is their ability to summarize, focus and condense the complexity of dynamic landscape environment to a manageable amount of meaningful information. By visualizing phenomena and highlighting trends (Rosales, 2010).

Indicators of urban landscape sustainability: What are they and why create them?

An indicator is anything that gives an indication to its reader of a key feature or state of a human or environmental system (Miller, 2007), (Bossel, 1999). Most frequently, indicators of sustainability take the form of quantitative measures of key features of human or environmental systems that relate to the long-term viability of human communities to better inform citizens, public, officials, scientists, or others who make decisions about aspects of sustainability, so as to improve the choices they make.

However, indicators are not merely technical measurements; they are hybrids that meld technical considerations with human values (Miller 2007). Making use of sustainability indicators requires investing those indicators with meaning to the people who will have to use them, and that means adopting a different approach to creating them in the first place. Recently, many indices and rating checklist have been activated to ensure the efficiency and performance such as LEED, BREEAM, SBTOOL, and CASBEE ...etc. A November 2009 SITES report notes that landscape must improve the inherent benefits and services provided by ecosystems regardless of the type of site use, this is to be done through design, construction, operations and maintenance practices that follows the essence of sustainability ethics (Sustainable site initiative[SITE], 2009). This type of good practice represents a source for stating indicators that reflects critical issues concerning landscape.

For this, a rating system Credits are rewarded for areas that include initial site selection, pre-design assessment and planning, water, vegetation, materials, human health and well-being, construction, operations and maintenance and finally, monitoring an innovation. Seeking indicators for sustainable landscape is a complex issue and it falls into the responsibility of several parties such as the decision makers, designers, authorities and communal organization. The interest of each category affects the set of indicators represented by them and this may have negative impact upon the holistic concept of the sustainable urban landscape patch. This holistic approach can be articulated through basic principles discussing the degree of change for a certain site, the cautiousness in making decisions that could be risky, the responsibility to economic, environmental and
cultural conditions with respect to the local, regional, and global context, the use mimic patterns of the ecosystem benefits, the use regenerative technology and approaches, the use of system thinking approach, understand and value the relationships in an ecosystem, reflecting and sustaining ecosystem services; re-establishing integral and essential relationship between natural processes and human activity, linking long-term sustainability with ethical responsibility and Maintaining integrity in leadership and research Implement transparent and participatory leadership.

What makes for a good sustainable landscape indicator?

There are problems that could appear while choosing and using landscape indicators. Subjectivity represents one major problem, either on the selection of the representative indicators according to certain background weather scientific or social background (Bossel, 1999; Hasna, 2008), or on the evaluation of the indicators results according to lack of appropriate data which may result on missing vital information. In sustainable landscape, this could further lead to measuring what is measurable rather what is important. Other problem is over aggregation of too many things resulting in an unclear meaning and therefore bad communication and analysis capability.

The quality of sustainable landscape indicator can be assessed according to:

- Policy relevance or guiding visions and goals that describes the ability of the indicator to be associated with one or several issues, such as environmental, economic, visual and social. This linkage helps the indicator to motivate actions.
- Simplicity which present the information in an easily, understandable and appealing way.
- Validity questioning is the indicator has true reflection of the facts and if the data collected using accepted measurement techniques.
- Time-series data, describes the availability, reflecting the trend of the indicator over time.
- Availability of affordable data determines whether good quality data is available at a reasonable cost or it is feasible to initiate a monitoring process that will make it available in the future.
- Ability to aggregate information describes whether the indicator is about a very narrow or broader sustainability issue. For practical reasons, indicators that aggregate information on broader issues should be preferred. For example, in sustainable landscape setting some indicators could determine the status of certain concern and is preferable to measuring many other landscape potentials.
- Sensitivity so the indicator must detect a small change in the system.
- Reliability is achieved when the indicators arrives at the same result if you make several measurements of the same indicator.
- Another important concern is meaning discussing whether the indicator has meaning for people. Does it motivate them to want to change the way things are currently done? Does the indicator communicate more than just its factual content?
- It is important for the urban landscape
sustainability indicators to have good governance. Thus, indicators emerge from a process that engages people in defining and implementing sustainability in their own lives.

- Indicators have to ensure adaptability and flexibility, communities may acquire new values, learn new things or find better measures. The system of indicators has to be flexible and adaptable enough to change (Hardi and Zdan, 1997; Bossel, 1999; Miller, 2007).

The classification of urban landscape indicators varies and can be based on what aspect of the sustainability is assessed, what techniques/methods are used for appropriating index like quantitative/qualitative, subjective/objective, cardinal/ordinal, one-dimensional/multidimensional, and whether the indicator compares the sustainability measure for urban landscape across space or time or in terms of input or output (Singh, Murty, Cupra, and Dikshit, 2009).

**Indicators, orientors and sustainable urban landscape**

Urban landscape sustainability can be understood as the capacity of a landscape system to generate and maintain environmental conditions for an adequate, safe, harmonious and healthy habitat with a high environment quality that respects natural eco-systems that support it (MacKendrick & Parkins, 2004). This can define a set of sustainability indicator modules for urban landscape such as:

- The Safety Indicator Module which includes a variety of issues going from the satisfaction of primary needs such as health, learning to the protection against crime as well as the impact of natural and technological disasters.

- The Healthy Indicator Module that refers to a landscape within the city that has a healthy environment and that takes into consideration the environmental impacts of urbanization and urban landscape development patterns. This module incorporates indicators related to quality of the urban environment, urban form, urban metabolism, and sustainability of the urban local system (Kural, 2007).

- The Visually and Cultural Appealing Indicator Module which refers to the spatial quality because an appealing quality built environment contributes to collective interaction and favors the social cohesion in cities, quality of public space, the vitality of the city and urban landscape.

- The Efficiency Indicator Module that is another approach towards sustainable cities includes an urban development that guarantees the protection of natural, historic, architectural, cultural and artistic heritage (Hales & Prescott-Allen, 2002). These modules represent the most frequent demands for users in their landscape settings (see Figure 4).

- Another important thing is that understanding landscape as a system and subsystems has to elaborate the determination of the constraints and forces formulating them, thus understanding these forces is of great importance especially when figuring the hue of relevant indicators, as:

- Constraints of physical conditions and laws of nature that state that not everything is possible. This implies restrictions on landscape patches that cannot be circumvented. Such as, Physical environment and its constrained development by the existing conditions of the context and global environment.
• Constraints of human nature and human goals that state that not everything is desirable. This means that users for certain site are not restricted to act in narrowly confined ways.

• Constraints of time that are clarified in the role of time that determines the ratio of rates of threat to rates of response. If responses cannot keep up with threats, viability and sustainability...
of urban landscape are at risk.

The understanding of these constraints should determine the limits and the prospected performance from landscape system. In addition, it ensures the applicability of the proposed landscape indicators and their proposed range of acceptance. Bossel (1999) introduced the term orientors to represent interests, values, criteria or objectives. Orientors in urban landscape are labels for certain categories of concerns. They are mostly general terms like health, existence, freedom, security and so on that represent important interests of people or systems in general, but which cannot usually be measured directly. Inferring their state of fulfillment could only be achieved from observing appropriate indicators, like temperature, leaf color, vegetation density, fluctuation of use and other indicators that reflect the nature of urban landscape patch and the pattern of use in it.

Developing indicator systems without explicit reference to the orientors about which they are to provide information does not make sense. If indicators for landscape sustainability are needed, the parties concerned in the design and development of urban landscape settings should be clear about what orientors would have to be satisfied to ensure a path of sustainability. These orientors have to reflect the relation between the environmental property and system category as a base for their emergence (Bossel, 1999) different environments (sea, land, desert, arctic) enforce attention to an orientation towards existence, causing plants and other organisms to avoid environments with which they are not compatible. Resource scarcity (water, land and energy) imposes an orientation towards effectiveness, causing humans to develop effective and efficient means of using scarce resources.

The diversity and variety of environments cause an orientation of freedom of action, allowing humans as users and human organizations to respond selectively and appropriately to a multitude of environmental challenges. In some landscapes, the unpredictable variability of the weather imposes an orientation of security on humans and animals, causing search for shelter and food storage.

Eventual change in the environment causes an orientation of adaptability, enabling organisms, ecosystems and human organizations to cope with changing environment by changing their own structure and processes. The presence and behavior of other systems in the same landscape environment causes an orientation of coexistence (Bossel, 1999).

**Quantifying/qualifying value control:**
Combining indicators with a performance scale.

Indicators measure completely different things. A common unit is needed that does not distort what we value about every single item. (Prescott, 1997) The most widely used common unit is money. The performance scale is presented by Prescott Allen in the field of sustainable development as an alternative to money, to allow the use of measurement that is most appropriate to the issue concerned. Cost and added value are measured in money. But other concerns related to landscape such as health, comfort, livability is measured in rates, numbers and percentages, and so on. Then, it is needed to define what are accepted and not
accepted concerning landscape indicators which helps to improve understanding of the nature of sustainability in such a domain, the result is a set of performance measurement, all using the same scale and therefore able to be used together and combined. Discussing key issues for sustainable landscape setting and stating the desirable and unacceptable performance range are critical to build consensus awareness on the relationship of human and environmental wellbeing that can be supported by designing landscape. Other concern is the compatibility between the surface and core system for the landscape patch which ensure the site wellbeing.

**Implications of a Performance Scale for the Choice of Indicators**

A performance scale can combine only those landscape indicators to which one can attach a performance value. Indicators are chosen if it is possible to define values for them that would be desirable, acceptable or unacceptable with respect to human or ecosystem wellbeing or with respect to the surface and core systems wellbeing that define them. For example, the quantity of a nutrient (such as nitrogen or phosphorus) in volume unit of soil is a valid performance indicator because it is possible to define acceptable (unpolluted) and unacceptable (polluted) levels.

**Organization of indicators**

The indicators are organized and combined up hierarchically from the lowest to the highest level. Let the levels be: System, Subsystem, Dimension, Issue and Indicator. Combining indicators up to the subsystem level yields two results (for two main subsystems affect the performance of a whole landscape system such as an index of surface system and an index of core system). These are combined and projected upon performance scale into an index of sustainability or overall wellbeing by reading the intersecting points on the barometer. Combining scores of indicators also should take into consideration if the indicators are equally important or they should be weighted and averaged. Similarly, if a dimension is represented by one issue, that issue’s score is the dimension’s score. If the dimension is represented by two or more issues, the issues have to be aggregated following the same procedure. This process is introduced by Prescott Allen in the field of measuring sustainable development indicators. This paper is adapting the process for assessing sustainable urban landscape. It is also important to be aware that some Composite indicators are based on sub-indicators that have no common meaningful unit of measurement and there is no obvious way of weighting these sub-indicators. So, a clear idea is needed of which sub-indicators are relevant to the phenomenon to be measured (Urbel, 2003).

**Sustainable urban landscape indicators: appropriating a frame for assessing indicators**

The process of creating and assessing indicators of urban landscape sustainability is important, therefore, it helps the decision maker (the designer) to operationalize his ideas about urban landscape sustainability (Winograd and Farrow, 2011; Reed, Fraser, Dougill, 2005). The proposed framework for assessing sustainability indicators for urban landscape is configured through sequence of steps illustrated in Figure (5). First of all, the definition of the landscape system is needed to be clear and leads to a clear determination to the relevant two subsystems.
that are affecting its performance. This will elaborate accurate configuration considering the other subsystems that are relevant to the major ones. Once, this level is clarified, it is needed to define the relevant dimensions and their relation to each subsystem. In addition, the set of orientors under every single dimension is need to be configured, this will lead to determine the number and nature of relevant sustainable indicator under each orientor. Then, appropriating a performance scale for each indicator and also to determine the score of each indicator upon the performance scale. Finally, combining scores from the level of indicators up to the level of subsystems and projecting the dual value for the landscape
system as a container of both surface and core system is projected upon the combined performance scale for each system. This loop is cyclic and has to end by reviewing results and assess implications.

This framework could be applied upon landscape systems for assessing and combining the sustainability indicators relating surface and core systems (also, can be applied relating other landscape duals) according to the following hierarchy of levels and their relevant components, as shown in Table 1 for site landscaping system:

- Subsystems (level 1) as, surface system and core system. The combined scores for these systems are projected upon scale divided to five.

Table 1: Assessing landscape sustainability indicators (Source: Author).

The number and nature of Indicators are based on several backgrounds such as theory, empirical analysis. They also cover the variety of orientors and dimensions. Selection requires a balance between simplification and complication. Based on the goal, the components will have to be selected whether it is of universal significance or for local conditions, as shown in Table 2. Approaching the proposed framework for assessing urban landscape sustainability has to be combined by an appropriated tools for analysis and combining indicators.
margins (each one is 20 points) as bad (0-20), poor (20-40), medium (40-60), good (60-80) and very good (80-100), so the good performance must achieve the highest score for the two subsystems involved in the assessment.

• Subsystems (level 2) as soft, hard, water, furniture, irrigation, drainage, infrastructure and horticulture. (The score of systems is deducted by averaging total sum of values for each subsystem divided by the number of proposed subsystems).

• Dimensions as, functional, environmental, aesthetic, economy, sociability and maintainability. (The score of subsystem is deducted by averaging total sum of values for each dimension divided by the number of proposed dimensions).

• Orientors as, vital, special, flexible, useful, safe, green clean, curing, recycling, charming, pleasure, etc. (The score of dimensions is deducted by averaging total sum of values for each orientor divided by the number of proposed orientors).

The use of tree diagram for breaking down the landscape system and distributing the involved indicators acts as on-hand appraisal tool. This helps to organize sustainable landscape indicators and enables the landscaper to configure the possible relation between landscape settings as a system and its relevant subsystems, dimension and smaller classifications. This gives an elaborated and holistic view for the landscape settings. In addition, this tools helps to determine the cross relations between the dimensions and orientors and their common indicators. The flow up of combining indicators from the level of dimension to the level of subsystems and system using the tree diagram is illustrated in figure 6. For example if the scores of water quality and water supply on the performance scale are 40 and 70 respectively, so the score of the water as dimension - in the case of the same relevant indicator importance- will be 55 on the performance scale.

**Conclusion**

The landscape settings do have a great deal towards enhancing sustainability in the urban fabric due to its hue, which combines natural and manmade components. Sustainable urban landscape encompasses more than ecological concerns. Although ecological concerns and adapted technologies are mostly connected to sustainability, sustainable urban landscape has to appropriate other intangible dimensions. Thus, there are several aspects considering
the sustainability of urban landscape. These aspects are differentiated between aesthetics, functionality, environmental awareness, cost effectiveness and maintainability. These aspects are also associated by other concerns such social and communal interactions. Sustainable urban landscape is a state of balance and complementation between these aspects altogether in order to enhance the contextual environment and to raise the quality of life. One of the pillars in sustainable landscape approaches is to believe on the aesthetics, visual interests and perceptual preference of functional, ecological and workable landscape patterns rather than the artificial, vague ones.

Although rating checklists as “Leed and Site” give a qualitative value control/analysis, it is still needed to work on quantifying qualitative attributes for sustainable urban landscape by clarifying indicators statements and its initiator orientor as a keystone in assessing sound figured values for sustainable site landscaping conditions. Thus, some of the indicators have a defined and direct scaled value but there are many which are hybrid and have embedded indirect values. The landscape is not simply an ecosystem versus human wellbeing system. Other systems such as surface system and core system might be involved according to the level of influences that is analyzed.

It is of great importance to define landscape settings as a series of correlated operational systems. This will appropriate a better understanding concerning contextual and in core impacts. Thus, the quality of sustainability index of any system depends on the accuracy and comprehensiveness in stating relevant indicators and figures the scaled value for them. Also, this quality is affected by the multidisciplinary, indeterminacy, dynamism and morphogenesis aspects in site landscaping patches, which increase the level of difficulty and complexity in assessing sustainability indicators.

References


Sustainable Urban Landscape: 
An Approach for Assessing and Appropriating Indicators


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THE UNRESOLVED ROOFTOP

Simone Medio

Abstract
This study is prompted by the observation that an overwhelming number of buildings in the world have rooftops that are architecturally irresolute, under designed, uncharacterised; in one word: unresolved. In those instances, the level of design resolution of the rooftop is insignificant when compared to its corresponding facade. There is an evident, sudden drop in design tension and architectural investigation. Has this condition perpetuated through time, and is this trend continuing? What alternatives are there to the unresolved rooftop? This study seeks to explore the topic of the unresolved rooftop in architectural design, defining its features and origins and providing evidence of its visibility and presence in the world. It associates the design of the unresolved rooftop to the flat rooftop of the modernist era, and proposes it as a recurring theme and opportunity in contemporary architectural design. The study limits itself by suggesting three areas of investigation into the persistence of the unresolved rooftop in design practice and education and provides examples of counter-trends with the scope to stimulate a greater awareness of the unresolved rooftop and to promote change.

Keywords
Unresolved rooftop, rooftop investigation, practice, education, generative design.

Introduction
The outer surface of a roof represents the moment when a building confronts itself with the sky. It is a moment ripe with potential architectural expression and design integration, describing a building's relation to the vault of the sky. At rooftop level, the privileged access to the sky's elements, such as sunlight, solar energy, ventilation and view, is a call for a selective connection between the inside and outside of the building, a type of connection that is typically present in a building's main elevations and in pitched roofs, through the careful exploration of building tectonics, materials and opening typologies.

If, however, we look at buildings from above, we are likely to see an urban landscape of prevailing grey; undefined rooftops (see Figure 1).

We can appreciate a building's architectural richness as we walk along the street, only to see, if we look down upon it, the emptiness of its rooftop design content. In many cities, rooftops are asphalt-clad surfaces of poor architectural quality, assigned to the role of back-alleys. If it
is the case that buildings are three-dimensional artefacts, to be experienced not only from street level and within but also from above, then one cannot but question the lack of design resolution of the rooftop. The visibility of rooftops and the architectural opportunities that rooftop design offers calls for a critique into the degree of rooftop design integration and resolution. This, in turn, has the potential to stimulate architectural innovation and improve the quality of the built environment. This study proposes the unresolved rooftop (UR) as a recurring theme and opportunity in contemporary architectural design.

The study begins by qualifying the UR and arguing for its consolidation as an archetype. It then limits itself by proposing three lines of inquiry into its persistence in architectural design practice and education. These are: the designer’s perception of the UR; the UR and design representation tools; and the UR and design conventions. As a means of proposing alternatives to the UR, the study then proposes examples of counter-tendencies in rooftop design. Finally, the study draws conclusions regarding emerging themes in UR resilience, and proposes directions for change.

**Qualification of the Unresolved Rooftop**

The ‘Oxford English Dictionary’ (OED, 2012) ascribes to the adjective unresolved the following meanings: ‘irresolute’, ‘undecided’, ‘unsolved’; but also: ‘undetermined how to act’. For the scope of this paper, the researcher associates the compound noun unresolved rooftop to a moment of a sudden drop in design tension and investigation within a building’s design process, perceptible even by to untrained eye, irrespective of whether the roof is accessible or not. Buildings designs that have stopped pursuing architectural design exploration at the rooftop level leave the roof as an engineering matter with same, easily recognizable outcome. That is: a nondescript, inaccessible rooftop surface, or an exposed, accessible open air space in need of shelter; both conditions that are, in this paper, considered architecturally disengaged from the rest of the building and, hence, unresolved. It is noted that the UR tends to manifests itself in flat roofs. Typically, as the pitch of the roof increases, so does the level of its structural
complexity, its constructional finesse and architectural resolution (see Figure 2). We find, for example, that in the UR the structural system is typically of simple order, and the finishing of predominant utilitarian function. The finishing of most unresolved rooftops that we can observe today is of built-up ply or paint-on rubber membrane, concrete slabs, gravel or grass, and its constructional challenge is often reduced to weatherproofing. In the flat UR there exists poor architectural connection between the building’s internal spaces and the sky.

Flat, unresolved rooftops are visible from higher-level floors and from elevated landscapes, a likely and familiar event, particularly in compact city environments and contoured topographies (see Figure 3). The irresolution and simplification of the flat roof cannot be explained by our inability to view the full form of a building, thereby questioning the disengagement that occurs at a creative level, within a building’s design generation and its development process.

If we search for literature that combines flat rooftop design, with the notion of irresoluteness, however, we find only tenuous references and have to seek other word associations. We find, for example, ample references to the topic of the flat roof in association with Le-Corbusier’s five points in architecture (Colquhoun, 2002; Edward, 2003; Frampton, 2007), and to architectural archetypes (Thiis-Evensen, 1989). Nevertheless, most literature that addresses the issue of the flat roof and its alternatives does so in terms of recognition of its achieved status in architectural design. Such is the case of most books on rooftop architecture that favour to showing structural additions and adaptations to the rooftop, based on the essential notion of the ground floor re-proposed (Melet & Vreedenburgh, 2005; Schleifer & Serrats, 2010). Little is said on the selective opportunities offered by the outer skin of the flat roof and

![Figure 2: Richness and complexity in pitched roofs, NYC (Source: Author).](image1)

![Figure 3: Irresoluteness in flat roofs - Genova, Italy (Source: Author).](image2)
its structural and aesthetic potential. The emphasis, the researcher found, is placed on the acceptance of the flat roof as a state-of-fact, to be developed and adapted as open air space in which to dwell, or used as a flat ground surface to build upon. This notion is well expressed by Andrés Martínez, in ‘Dwelling on the Roof’ (Martínez, 1999) where the author reinforces the validity of open air roof-terrace dwelling by referring to vernacular, climate-responsive architecture. He does at times concede, however, on the role of roof shelter to temper such terraces (Martinez, 1999; p.17). In particular, the researcher found a proliferation of recent publications that discuss green roofs as the overall sustainable design resolution of the flat roof (Werthmann, 2007; Getter & Rowe, 2006). In addition, there are a multitude of guides and manuals on green roof design that suggest an add-on technology available for almost any flat roof surface (Snodgrass & McIntyre, 2010; Dunnett & Kingsbury, 2008). The researcher did not encounter, however, literature that convincingly questions the reductive nature of flat rooftop design or the potential drivers of its persistence in current practice and education. Conversely, however, the researcher found important examples from professional practice that show an awareness of the issue of the UR, and a push for generative design.

The Unresolved Rooftop as Archetype

Examples of a drop in design tension between a building’s flat roof and its corresponding facade may be found in diverse time periods and geographic locations. We find them in vernacular (see Figure 4) and project-led architecture. We find them in cold climates, where the function of its outer skin is limited to encapsulating and insulating the building’s occupiers, and in warm climates, where its open-air usage fundamentally offers the function and imagery of ground level. It is in the modernist, industrialized era, however, where the association between the flat roof and irresolution becomes a recurring, prevailing theme. The applicability of new materials in the building industry, specifically reinforced concrete and steel, plays a central part in the creation of the UR as archetype. This is enhanced by the formulation of design manifestos and construction principles of the period’s leading architects, who regard flat roof technology as an opportunity to integrate its imagery into a design program (see Figure 5). In ‘Towards a New Architecture’, Le Corbusier states (1924; p.61) that the advent of reinforced concrete has “brought about a revolution in the aesthetics of construction,” which will allow for roofs to be suppressed and replaced by terraces. Concurrently, in the growingly dense cities of the new world, the use of steel pushes towards a vision of inconclusiveness and infinite vertical expansion.

As the UR consolidates and is replicated in building construction, so does the architect’s validation of its reoccurrence in architectural design. At best, this resolves in the proposal of the articulated rooftop terrace; this is the case with most of Le Corbusier-inspired archetypal buildings with open-air rooftop spaces (which, however, arguably remain unattractive in cold climates, and in hot climates the need for sun shelter is soon felt.) At worst, this resolves in a weatherproof fix of the design-severed roof, as with most of Mies Van de Rohe-inspired archetypal buildings, and in modernist buildings that use flat roof technology as a building’s practical but architecturally estranged
conclusion. Most modern cities offer the viewer this condition: different levels of rooftop design resolution that go from a bland simplification of the flat roof aesthetic, to its adaptation as an outdoor space or newly speculated real estate plot. All these outcomes, this paper suggests, atrophy the flat rooftop’s functional and expressive potential in architecture (flat roofs, like pitched roofs, can command high levels of complexity and integration in a building).

For the scope of this study, there is evidence to suggest that this design tendency is continuing. The vast majority of current building designs that incorporate flat roofs (the percentage of which could be calculated) neglect the rooftop as an integrated part of the building’s design process and design outcome. Moreover, the body of examples from architectural design education that show flat roof designs indicate that this tendency might continue in future generations of architects. The reoccurrence of the UR, and its potential proliferation in the future, suggests underlying drives that are connected to how designers perceive the UR, the design tools used to represent it, as well as how we are expected to experience it.

Figure 4: Façade/flat roof contrast in vernacular architecture, Saana, Yemen. (Source: Ferdinand Reus, Wikipedia Creative Commons).
The Unresolved Rooftop in the Design Process: Three Lines of Inquiry

This paper presents the UR as a sudden drop in design tension and investigation in architecture and as a visible, recurring theme in the built environment. Three lines of inquiry are proposed to study the UR resilience in design practice and education with the scope to promote change. These are:

- The designer’s perception of the UR, which examines the relationship between the internal and external restrictions within the design process, and its outcome in terms of rooftop design investigation.
- The UR and design representation tools, which examines the connection between the UR and the current tools used for designing architecture.
- The UR and design conventions, which investigates the connection between the UR and the designer-viewer conventions that govern a building’s appreciation.

The designer’s perception of the unresolved rooftop

This line of inquiry draws from the designers’ experience during the design development phase, and aims to individuate, through a grounded research methodology, emerging themes that concern the UR generation during the design process. Under focus is the balance between a project’s fixed external constrains (i.e. legislative, economic, environmental) and the more flexible and design-led constrains (i.e. spatial, functional, cultural, aesthetic) (Lawson 1990).

In design practice, initial investigations through a direct interview process at the firms of Bennetts Associates, London (P.Fisher, personal communication, June 18, 2012), Pelli Clarke Pelli, NY (D.Hesse, personal communication, October 10, 2010) and Costa Kondylis, NY (B. McCormack, personal communication October 6, 2010) suggest that, within a building’s fixed constrains, the perceived value-for-money of flat roofs plays a decisive role in the formation of the UR. Furthermore, within a building’s budget, rooftop design exploration and resolution is the first aspect to be sacrificed. What is more, in many instances the UR is the chosen condition to facilitate the rest of the building being developed with maximum economic resources and full design attention. Given the designers’ uncertainty as regards a project’s success in the real world, it begins to emerge that the UR economic implications can be controlled with exactness while its aesthetic acceptance is perceived as a given. Thus, for that reason, it is of lesser concern to the designer. The visibility of
the UR, however, suggests that the distribution of economic resources within a building’s aesthetic and functional outcomes is prone to misinterpretation, thereby resulting in a missed opportunity in rooftop design exploration.

Fixed and flexible constrains have different impacts depending on whether the design process occurs in practice or in education and therefore, one would assume, on the designer’s perception of the UR. In architectural design education, however, where students are asked to focus on the building’s flexible constrains, and they typically have the choice to limit their concerns to the economic implications of their design decisions, the perception of the UR remains largely unchanged. The researcher’s experience as a tutor in reviews and presentations in upper-level studios at schools of architecture with diverse cultural and philosophical background, in the period 2004-2012 (UL 2012a, 2012b, 2012c; Unife, 2009; VUW, 2012), has revealed a reoccurring resilience to rooftop investigation. Students need to be prompted to discuss about their approaches to flat roof design and this typically takes place towards the end of their design presentation, further suggesting that it also holds a secondary position in the building’s design process. Consequently, students’ flat rooftop proposals remain restricted to add-on solutions, with the provision of rooftop gardens or the installation of PV arrays, which are brought to the tutor’s attention primarily to illustrate the project’s environmental responsibility. These self-proclaimed design limitations, the researcher suggests, contrast the explorative-prone environment of studio culture. It reinforces the notion of the UR as archetype, deeply embedded and encapsulated within the designer’s unconscious, insufficiently questioned or challenged.

The unresolved rooftop and design representation tools
The reductive nature and limitation of representation tools in the architectural design process has been thoroughly discussed in the writings of Bruno Zevi (Zevi, 1993), and Alberto Pérez-Gómez and Louise Pelletier (Pérez-Gómez & Pelletier, 1997). In this proposed line of inquiry, the way such tools are used is questioned specifically with respect to their implications for the UR. The representation tools in question are: elevations, 3-D representations, roof plans, and physical models.

Elevations continue to be used (and requested by clients, contractors, and studio tutors) as the quintessential tool to present a building’s composition. While offering key information on a building’s proportion, scale, and materials, elevations nonetheless further provide a distorted, facade-led building aesthetics. Their artificial horizon line misleads from an all-round, spatial understanding of the building in its making, discouraging rooftop design exploration. 3-D representations (whether drawings or computer images) are used selectively. They are, in other words, applied to the study of the building’s design within the limitation of their own set frames. As such, they can be used to reduce or dismiss rooftop design investigation, or avoid acknowledging the UR’s visual implications in the built environment. Typically, within the suite of orthographic drawings required, the rooftop is directly shown embedded within the site plan. Here, however, the focus is drawn away from the rooftop as an important part of the building’s overall architecture, and placed towards the
relationship of the building’s external contours with its surrounding ground level. In the site plan, the importance of rooftop design is minimised, subtly relieved of responsibility.

The way in which elevations, 3-D representations and roof plans are currently used in the design process, this line of inquiry suggests disfavours rooftop design investigation. Physical models, conversely, can play a crucial role in rooftop design, being contemperarily revealing of the UR issue and design generative. In design education, it is through physical investigation that designers can generate ideas and develop the making and understanding of space (Salama & Wilkinsons, 2007). Once the prime, mandatory representation design tool (in the Renaissance no significant building could be proposed without them), physical models compel a viewing of the building from above and beyond its immediate context. They stimulate building tectonics exploration (structures in physical models can be physically felt and broadly tested) and promote invention at the rooftop level.

Nevertheless, there is evidence to suggest that, as capacity to use digital representation tools increases in the design development process, so does the tendency to override physical models as a study tool (Bermudez & King, 2000; Caldwell, 2010). Conversely, we find studies that explore ways to bridge the gap between digital and physical modelling (Hadjri, 2010; Nassar, Mostafa, & Rifki, 2010). The divergence between drawn and digital images, and the physical model, the researcher suggests, has a direct outcome in rooftop design. By superseding the physical model there is a capacity for the designer to neglect rooftop design investigation.

Significantly, when prompted to produce a physical model of a flat roof building design, students tend to show the physical model without the roof. Instead, they elect to show the more interesting rich articulations that lie inside the model, as they would with drawings and digital images. The tabula rasa of the flat roof evidently represents an inconvenient challenge for students, a challenge, however, that also has the potential to provide them with the condition to transform the way their building is conceived.

A systematic investigation is required to explore ways to use representation design tools that will promote a greater awareness of the UR (such as the reinstatement of physical models as a fundamental tool for the design process) and new, informative methods that offer a greater awareness and control of rooftop design and its impact on the built environment.

The unresolved rooftop and design conventions

In this line of inquiry, the aim is to investigate the connection between the UR and the conventions that govern a building’s appreciation. The inquiry looks at the relationship designer-viewer relationship, more specifically, on how the designer sells a project and how that is expected to be consumed by the viewers. It is based on the assumption that, as with other art forms, architecture has conventional restrictions that determine its readability and appraisal, implying an unwritten contract between a building’s designer and the viewer of that building (Holgate, 1992). Within these conditions, the appreciation of a building and the way it is supposed to be experienced is in its immediate proximity, disregarding the UR implications in the larger context. For example, it is conventionally assumed that a category
of building parts, such as its sides and back, will have restricted physical or visual access. Although visible, and potentially accessible, the UR is brought to fall into this category, leaving the building’s main fronts and interior spaces, as the building’s decisive selling parts. Such conventions are anachronistic to a spatial-temporal understanding of rooftop design, and contribute to further consolidate the UR. They continue, however, to hold ground in design practice and education, holding back the significant advances needed to promote change and make a difference in the visual experience of the built environment.

Image-led architecture plays a decisive role in the reinforcement of design conventions and the visual exclusion of the UR. In design practice, images are used to market a selectively framed architectural product (see Figure 6) that allows distancing from rooftop investigation (see Figure 7). In design education, elaborate effect-based graphic re-presentations continue to attract what is perhaps disproportionate attention. In this sense, the architectural product is not only consumed in the real world but also “within a photographic image of itself” (Porter, 2000; p.6). We have evidence of this in the numerous examples of academic books, specialised architecture journals and design practice websites. There are always key, controlled selling viewing points that tend to exclude the UR. Flat unresolved roofs are shown only in the context of the urban landscape, in urban design schemes where the identity of an individual building is unrecognizable and blurs with other rooftops, or as an adaptation. It is a state of affairs that arguably feeds itself, with the expectations of the viewer corresponding to the interests and efforts of the designer. In this sense, the disengagement from the UR needs to occur within a research environment and in design practices that have the means to allow conventions to be radically questioned.

Figure 6: Image showing the new Engineering Faculty building Lincoln, UK (2011). (Source: Allies and Morrison architects, UK).

Figure 7: Finalisation of the Engineering Faculty gravel rooftop. Lincoln, UK, 2011. (Source: Author).
Counter-Tendencies

The technological advances developed during the modern industrialised period allow us today to provide a building with a structurally sound and an environmentally selective envelope whilst fostering architectural expression and resolution. Like pitched roofs, flat roofs can offer a high level of design exploration and promote innovation. In providing examples of counter-tendency to the UR the researcher proposes two directions. These are: the reinvention of the flat roof in new buildings, and the UR transformation through integration of existing buildings.

The reinvention of the flat roof in new buildings

In ex-novo design perhaps one of the most significant ‘pushes’ towards a visual, functional and technological exploration of flat rooftop design can be found in the California Academy of Sciences (2008), by Renzo Piano (see Figure 8 and 9). Predominantly flat, the large roof design sensitively responds to the building’s internal and external conditions. It does so structurally, through a frame of steel ribs that curve to accommodate the two tall exhibition spheres; and environmentally, through a vegetative carpet that thermally tempers the interior spaces and a cluster of round skylights that illuminate and naturally ventilate the spaces below. The design of the building is a collection of explorations of what the flat roof can be: the large skylight at the entrance of the building, for example, is developed as a carefully crafted concave-concave structure, rather than an add-on skylight component of the flat roof;

Figure 8: The California Academy of Sciences, San Francisco, (2008) by Renzo Piano. (Source: Author).
the building’s glass overhang integrates PV technology with the architectural program, proving shelter from rain and allowing for partial shade of the spaces below; and the vegetative carpet of 50,000 separate trays allows for the green roof to be ‘sculpted’ whilst retaining its water management function. It is crucial to state, however, that the roof is not dwelled, but only partly accessible to showcase these ideas, and to allow for a vantage viewpoint over the park. Arguably, we are far away from the notion of the ground floor re-proposed, and the visual connection between the green roof and the surrounding context is consequential to a “poetic solution of a constructive and functional problem” (Bucci, 2010: p.111).

In the Water Cube building in Beijing (2006), by the China State Construction and Engineering Corporation (CSCEC), PTW Architects and Arup (see Figure 10), the mergence between façade and flat roof is made complete. This seamless unification is made possible through a thick and hollow wall and roof structural element that, at roof level, defies gravity through a complex optimisation of the spatial grid. The building is entirely enveloped by a total of 3,000 pneumatic ETFE cushions, inflated by low-pressure air, which are retained by in aluminium extrusion and supported by the structural element. While allowing for daylight to permeate into the building, solar energy that enters at the structural level can be used to heat the pools.
and air that circulates within the cavity allows for cooling. The vital lesson from this example is that the flat rooftop is treated as a selective surface with a connotation and value that is equivalent to and in dialogue with the rest of the building. It reinforces the notion that contemporary technologies can allow a disengagement from the structural simplification of the flat roof typical of the modernist period, and allow the flat roof to begin to be treated as as an environmentally selective and aesthetically responsive surface.

Still under construction (to be completed by December 2012), the Cervantes Theatre, Mexico City, by Ensamble Studio (see Figure 11), illustrates yet another variation of the inventive opportunity offered at rooftop level. The building’s theatre spaces are entirely embedded underground. They are covered, starting at ground level, by an accessible plaza and a glazed surface, and surmounted by a large metallic canopy, dubbed by the designers as ‘Dovela’ (Keystone). More than a feat of technological innovation of structure and materials, the ‘Dovela’ is a sophisticated investigation into roof geometry, negotiating between the isotropic layout typical of the flat roof and the inclined surfaces of the pitched roof. The pitched metallic blades boxed within the ‘Dovela’ filter the harsh Mexican sunlight and collect the water within them, while establishing a framed view from the underside.

Figure 10: The Water Cube, Beijing, (2006) by CSCEC, PTW Architects and Arup. (Source: PTW Architects).
of the ‘Dovela’, and from the buildings above. The roof of the Cervantes Theatre is in fact a layered system where each of its components, the thermal envelope at the theatre’s roof level and the ‘Dovela’, plays a particular role in the roof’s composition and in negotiating the ground with sky.

Transformation of the UR through integration with existing buildings

Although an early project, the Offices for ING & NNH in Budapest (1994), by Erick van Egeraat Associated (see Figure 12), remains one of the most powerful examples of flat rooftop integration within an existing building complex. The design is a one and a half storey addition to an existing monumental building in central Budapest. The two main components of the building’s rooftop are a vast flat laminated glass surface acting as skylight, and a sculptural element nicknamed the ‘whale’ which functions as the board of directors meeting room. The glass surface is supported by a steel construction system, whilst the shape of the ‘whale’ is created through curved laminated wood ribs that are interspaced, according to location, by a glass or zinc skin. The ‘whale’ appears to be floating inside the flat glass surface. What is notable here is the organic
interplay that is generated between the building’s interior and the sky. The integration is: environmental, through the profuse access of daylight; structural, through articulated building tectonics that is also visible from the inside of the building; functional, through the connection of the ‘whale’ to the inner spaces; and visual, through the visual connection to the ‘whale’ and to the panoramic view of Budapest and the roof itself. The example demonstrates the vital integrative role that rooftop design can have for the entire building.

A more recent example is Diane von Furstenberg Studio Headquarters, in New York (2008) by Work Architecture, shown in ‘Architectural Record’ (Stephens, 2008). The headquarters house the company’s flagship store as well as the administrative and work offices and a rooftop apartment. The design of the building maintains historic facades, while providing a diagonal staircase that vertically connects the entire building up to the rooftop level. This circulatory connection additionally allows for daylight to enter through the rooftop, deep into the interior parts of the building. At rooftop level, the connection is established by breaking through the existing flat rooftop surface with a multifaceted glass structure housing, showcasing the penthouse apartment.

Despite being a modest scale intervention, the Covered Roof Terrace in Amsterdam (1991),
by Hans Slawick (see Figure 13) can be most enlightening. The top floor apartment of a five storey building, the project is composed of a main supporting steel frame, and a barrel vault structure created through a set of curved laminated wood trusses. The vault architecturally concludes the building whilst environmentally selecting the sky elements at rooftop level, protecting its occupants from the wind and rain. The use of acrylic rather than silica glass to allow the occupants to take advantage of the UV benefits of the Nordic sun is a simple and yet fine example of the selective opportunities offered at rooftop level. The Covered Roof Terrace acts as a reminder of the importance of tectonic design and how, starting from the UR, few design gestures are sufficient to regain a physical and expressive connection with the sky.

In both new and integrative design examples, the researcher would like to place the emphasis on the building’s relationship established with the sky, a renewed sensibility of the roof as an integral, visually accessible component of the building, as well as its aesthetic contribution to the site. In new building proposals, the designer has the opportunity to integrate the flat roof in a conclusive, architectural unity. In integration with existing buildings, the transformation of the flat UR establishes rediscovered levels of structural, functional and visual engagement within the existing building.

**Conclusion**

In this paper the researcher has presented the UR as a visible drop in design tension and architectural investigation, and associated it with the flat roof of the modernist period. This paper questions the resilience of the UR in current architectural practice and education and proposes lines of inquiry that have the ultimate purpose of stimulating a greater awareness of the UR and promote change.

In the three lines of inquiry various key themes begin to emerge. These are:

- In design practice, the perceived value-for-money of the flat UR tends to push design efforts towards other parts of the building, reducing rooftop design exploration and promoting the adaptation to the UR. In architectural design education, where economic constrains need not be a prevailing issue, rooftop design investigation continues to remain secondary, and with a limited range of proposals.

- The way current design representation tools are used, both in practice and education, discourages rooftop investigation. Alternative ways of using these tools need to be engaged, and alternative informative methods proposed to support a greater awareness of the UR and to promote change. In this direction, the researcher underscores the importance of reinstating the physical model as a fundamental study tool.

- Within the established conventions between the designer-viewer, and seller-buyer, the UR tends to fall under the category of ‘back alley’. The visual access to the UR and the potential evolution of the flat rooftop, however, is in strong contradiction with this convention. The persuasive power of image-led architecture in practice and education significantly contributes to this tendency.
All the preceding themes are in need of thorough investigation. In this sense, the role of education and research can play a critical role in stimulating a greater awareness of the UR, challenging its persistence and promoting change. Examples of counter tendencies from practice show how a generative approach to roof design, rather than an adaptation to the UR can trigger a disengagement from the UR and promote a full, spatial experience of architecture and the built environment.

References


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A new round of discussion on participatory design by a committed architect, consultant and educator and a giant in the field of community design is available to the international community. In this book Henry Sanoff presents some of the important cases that elucidate how design processes can be democratized. Sanoff discusses participatory design as a way to apply democratic principles into the creation of meaningful environments. He argues “Participatory design is an attitude about a force for change in the creation and management of environments for people. Its strength lies in being a movement that cuts across traditional professional boundaries and cultures. Its roots lie in the ideals of a participatory democracy where collective decision-making is highly decentralized throughout all sectors of society, so that all individuals learn participatory skills and can effectively participate in various ways in the making of all decisions that affect them.” One should note that based on a strong belief and value system Sanoff has been working in the field of participatory and community design for over four decades and his work has resulted in many design interventions that reflect such a long and outstanding career. Merely, this manifests...
A Sustained Quest for Democracy in Design and Planning Decision Making


ASHRAF M. SALAMA

A sustained quest for democracy in design and planning decision-making.

Democratic Design-Participation Case Studies in Urban and Small Town Environments includes four main chapters and an appendix. The first is an introductory chapter that sets the stage for a comprehensive, yet concise, understanding of participatory design and its association with democracy. The second chapter offers four case studies in small towns in Australia, North Carolina, and Japan. The third chapter presents three cases implemented in urban neighborhoods in Virginia, North Carolina, and Mexico. The fourth chapter presents four cases relevant to the design of community facilities in Kentucky, Brazil, North Carolina and Minnesota.

Notably, the selection of cases and their classification is unique. Cases related to small towns reflect current interests in Australia, Japan, and United States. They address key factors and issues that shape a successful intervention in a small town including cultural norms, social structure, the economy of a locality, and the way in which these factors are interconnected. Likewise, cases relevant to urban neighborhoods address issues that pertain to the question of what constitutes an urban neighborhood, its growth, and its spatial and symbolic qualities. Most important, the cases speak to current condition of neighborhoods (being) and how their future might be (becoming). On the other hand, cases related to community facilities address issues associated with ‘buy-in’ from user groups, while answering the question of how the process of introducing a community facility draws from networks such as civic organizations.

In essence, the book represents three sets of case studies in urban and small town environments in Australia, Brazil, Japan, Mexico and the United States. They reveal a variety of community participation methods that can be adapted for use in different contexts. Evidently, the methods implemented embody integral components of design processes. They are appropriate for use in both developed and developing contexts and are pertinent to a variety of building types and scales. The appendix is of great value since it presents tools that contribute to an efficient and effective implementation of participatory design processes.

It is important to note that Sanoff’s approach integrates the two types of democracy into design and planning decision-making. One type is representative democracy or advocacy where people exercise the making of decisions through representatives (user representatives), especially in cases where involving actual users is not achievable. Another type is direct democracy or participatory democracy where making decisions is exercised by a larger body of actual users, potential users, and other groups who share the same system of values and recognize the need for introducing change toward the improvement of their environment.

One should note that the Democratic Design-Participation Case Studies in Urban and Small Town Environments complements earlier works by Sanoff in which many other cases were presented and analytically described. In this respect, his earlier book titled ‘53 Research Papers in Social Architecture (1965-2005),’ addresses a wide spectrum of issues and themes that include people preferences, assessment methods, environmental cognition, environmental evaluation, ecological planning, energy and behavior, participatory architecture, post occupancy evaluation, and pre-design and programming. As well, his book titled ‘Three
Decades of Design and Community’ presents analytical discussion of cases developed by the many graduates of the Community Design Group CDG of the College of Design, North Carolina State University NCSU under his guidance.

While some scholars may claim that many of the participatory and community design ideas and concepts which are debated in recent literature, are fairly new, one should assert that the roots of these ideas were generated, developed, and implemented, and are evident in the early and the new work of Sanoff.

Indeed, Democratic Design-Participation Case Studies in Urban and Small Town Environments is a collection of cases that advances the discussion on community and participatory design. The book is of great value to architects, planners, local authorities, public officials, educators of architecture and urban planning, and citizens who wish to make it possible for people to be involved in shaping their future environment.

Sanoff’s Books include
- Democratic Design (VDM Verlag, 2010)
- Community Participation in School Planning (VDM Verlag, 2009)
- Programming and Participation in Architectural Design (Universitat Politecnica Catalunya, 2005)
- Community Participation in Design and Planning (Wiley, 2000)
- Creating Environments for Young Children (National Endowment of the Arts, 1995)
- Integrating Programming Evaluation and Participation in Design (Avebury, 1993)
- Visual Research Methods in Design (Van Nostrand Reinhold, 1991)
- Participatory Design: Theory and Techniques (Bookmasters, 1990)
- Planning Outdoor Play (Humanics, 1982)
- Learning Environments for Children (Humanics, 1981)
- Design Games (Kauffman, 1978)
- Designing with Community Participation (McGraw Hill, 1978)
- Methods of Architectural Programming (Dowden Hutchinson & Ross, 1977)

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NEIGHBORHOOD TEST DESIGN BASED ON HISTORIC PRECEDENTS

Besim S. Hakim

Abstract
There have been various attempts to emulate traditional architecture and to experiment with the form and aesthetics of building design. However, learning from precedents of urban morphology is rare. This design study is a test at the neighborhood level using the pattern of traditional courtyard housing that is prevalent in the majority of historic towns and cities of North Africa and the Middle East. The study is undertaken at five levels of design enquiry: dwelling types, dwelling groups, neighborhood segment and community center. All of which are synthesized into a full prototype neighborhood comprising of 428 dwelling units covering an area that includes circulation and the community center, of 17.6 hectares. The test demonstrates that the traditional pattern of neighborhoods that are based on the typology of the courtyard dwelling as the initial generator of urban form may be used to develop a contemporary settlement pattern that is compatible with current necessities of lifestyle, vehicular circulation, including parking and infrastructure achieving an attractive livable environment with an overall gross density, that includes a community center, of about 24 dwelling units per hectare.

Keywords
Test design, courtyard housing, neighborhood segment, prototype neighborhood.

Introduction
From the mid-seventies of the 20th century this author was working on a project on the building and planning principles of Arabic-Islamic cities towards achieving three objectives: (1) To identify and record the building and planning principles that shaped the traditional Arabic-Islamic city, (2) To evaluate, recycle and test the traditional morphology and its organizational principles via a contemporary project to determine their validity and usefulness today and for the foreseeable future, and (3) To document the findings in a systematic and clear format so that others may benefit directly. A manuscript for a book titled Arabic-Islamic Cities: Building and Planning Principles was completed in early 1979 and the book was eventually published in early 1986. It documents the research and findings for objectives (1) and (3). This essay is a summary of the work for achieving objective (2). The long hiatus of three decades has been an advantage, primarily to benefit from the insight of this author’s and the work of others that was published in the interim. The hesitation to publish this material since then...
was to avoid giving the impression that the primary benefit was to emulate the traditional morphology. It is a simplistic pursuit by many architects and urban designers that continues to this day. In fact, this author has come to the conclusion that essentially the processes underlying the traditional system are the level from which to draw the primary lessons.

In a short earlier study by this author, a framework was developed for recycling relevant aspects from the traditional experience of building and urbanism. That framework was divided into aspects related to the procedures of building, i.e. process, and to aspects related to the organizational system and built form, i.e. product (Hakim, 1989, 1991). Those related to the former considerations are by now reasonably covered by this author (Hakim, 2001, 2007), and the publications of others (Alexander, 1987). Three areas of design enquiry were identified within the product aspects of the framework: (i) Compatibility with ecology and climate, (ii) Physical organizational system and planning, and (iii) architectural design, style and decoration. Adequate studies have been published that relate to (i), and (iii) With the exception of a few studies (Petruccioli, 1998, 2007), (Kropf, 1996), very little is published about the second area of design enquiry: the physical organizational system and planning. This study is an additional contribution.

Housing is the predominant sector in towns and cities, and it is usually comprised of neighborhoods. Thus it was decided that this is the level at which a useful test design should be undertaken. The aim therefore of this test is to evaluate its outcome, a product resulting from addressing the issues and possibilities posed by the following question: Is it possible to design a contemporary built environment that achieves and embodies the best built qualities (both qualitative and quantitative) evident in traditional environments located around the Mediterranean basin and especially those in North Africa? (see Figures 1 and 2). This exploration and a reflective design approach is a pre-requisite for re-creating the desired built-form qualities and ambience found in most traditional environments of North Africa (see Figures 3 and 4). The test design was undertaken outside of a specific site, although a geographic area and cultural parameters were assumed as indicated below. The test design can thus be described as being generic and prototypical in its results. It recycles physical aspects only, and does not incorporate the sophisticated generative aspects of traditional urbanism. That kind of study waits to be undertaken.

Extensive research undertaken by this author clearly demonstrated that one of the major lessons offered by the understanding of the processes of traditional cities and settlements, found in the region mentioned above, was in the user’s role in the decision-making process which affected his/her immediate built environment. Furthermore this role necessitated that decisions taken by users had to respect a framework of rules which the culture at large established, and which embody its commonly shared values and aspirations. This author was able to incorporate those aspects of the traditional experience in a project for revitalizing the heritage district of a historic town (Hakim, 2007).
Figure 1: Ariel view of a part of Fez medina, Morocco, 1982, showing the compactness of the urban tissue. (Source: Georg Gerster).
Certain lessons from the morphology of the traditional system can be explored and tested by the individual designer. It is these lessons that this test design attempts to address (see Figure 5). They are concerned with the quality, characteristics and subtleties of the physical organization, planning and design aspects of those traditional environments. This is also an essential task if we are serious in our desire to recycle and recreate those positive qualities.
and lessons offered by centuries of experience. To undertake this test design certain assumptions had to be made and design parameters established for the design of a Prototype Neighborhood. These are summarized below:

**Assumptions**

1. It is assumed that the inhabitants would share similar values (Hakim, 1986). This assumption provides the historic linkage to the users of traditional environments in North Africa, which is the precedent used for this test design.

2. The location was assumed to be somewhere in North Africa close to the Mediterranean coast between southern Tunisia and the area west of Alexandria, Egypt.

3. The site was assumed to be flat.

4. Local building construction practice and materials are to be utilized. These include the use of load bearing brick walls and simple reinforced concrete technology for roofing and foundation footings.

**Design Parameters**

These are established at various levels of the project, comprising (1) Dwelling Types, (2) Dwelling Groups, (3) Neighborhood Segment, (4) Community Center, and (5) Prototype Neighborhood. The following are the parameters at each of the five levels:

1. **Dwelling Types:** Three generic types were used (see Figure 6), these are (i) the square shape with the courtyard in the center, (ii) the U-shape with the courtyard on one side, and (iii) Z-shape with two courtyards in opposite corners. Dimension of plots for all three types is 14x14 meters and the primary courtyard is usually 5x5 meters. These dimensions are derived from the study of traditional settlements.
and towns, with adjustments to take into consideration contemporary life style and its requirements. Although these three generic types can generate, in principle, unlimited plans within the system’s parameters, however only four types were developed and are designated for testing (see Figure 7). This is because the test was designed to be undertaken manually. If a sophisticated computer program and the skill to run it were available, it would have been possible to undertake the test with customized house plans in response to simulated individual household requirements. The following statistics relate to this level of the project:
I. Ratio of plot to the ground coverage of each unit (including its courtyards) is 1:1.
II. Ground coverage of the largest unit, type B including the courtyards, is 196 square meters.
III. Ground coverage of type B, excluding its courtyards, is 156 square meters.
IV. Assuming that up to 2.5 stories is built up, based on the four house types used in the test design and excluding courtyard areas at the ground and upper levels, the average maximum area of all units is 340 square meters.

2. Dwelling Groups: (see Figures 8 and 9): Two critical rules were followed in design at the Dwelling Group scale. They are: (a) Avoidance of creating visual corridors into the private domains of adjacent dwelling units, especially into courtyards and the roof terraces/gardens that are designed to be used by the occupants. In addition, (b) preventing, as much as possible, the tight sense of enclosure by careful design considerations within private courtyards due to the high walls on most sides, and the tunnel

Figure 8: One of the dwelling clusters comprising 3 units of type C and two of type D in phase one of construction. Owners of each dwelling unit can later increase the area of their house incrementally upwards in two additional phases as shown (Source: author).
effects within streets due to high walls and fences that abuts them.

3. Neighborhood Segment (see Figures 10, 11, 12 and 13): Each segment consists of approximately 3.4 hectares that includes circulation, parking and open spaces. The following are highlights of the design parameters used at this scale of the test design:

   I. Ratio of dwelling unit to parking is 1:1.2.

   II. Separation of parking from the front door of the dwelling unit. Maximum distance allowed is 50 meters, but most front doors of dwelling units are within shorter distances. Grocery pushcarts are provided for every household at the parking cluster locations.

Figure 9: Four types of dwelling clusters show the increase in the area of each dwelling upwards to two additional floors for a total of three floors. The axonometric drawings for each cluster (top row) assume the maximum built up area for each dwelling (Source: author).
III. Maximum distance from any dwelling to a play area is 40 meters.
IV. Vehicular access is restricted within the segment, allowing only emergency vehicles, such as fire trucks, to penetrate the area. A maximum distance of 20 meters is allowed from a fire truck and its wheeled escape ladder to a face of a burning building.
V. Infrastructure lines are along streets and cul-de-sacs, and are not allowed to pass under buildings.
VI. Orientation: it is assumed for the test design that undesirable winds in the summer are from the south. Dwellings are rotated against this wind direction. This orientation of buildings will provide a balance of sun/shade within courtyards and the public domain. The Qibla (direction to Makkah) is taken as 19 degrees east to south, which affects the planning and design of the mosque.
VII. The concept of the Fina, which was operational in traditional built environments of North Africa, is the abutting areas to external walls up to about one meter in width and was the responsibility of adjacent owners or tenants. This concept was utilized to encourage the maintenance of a landscaped strip along the side(s) of pedestrian pathways (see Figure 14).

Figure 10: Neighborhood Segment: (right) Dwelling Type Allocation shows how the dwelling clusters are grouped that comprise the distribution of the four dwelling types within them and the whole neighborhood segment shows how it is accessed by streets and pathways and the location of parking, and (left) Building Heights includes the upward extension of dwellings and shows the ground, first, second, and third floors (Source: author).
Figure 11: Neighborhood Segment built form. This drawing is based on the segment and dwelling type distribution in figure 10 and assumes the maximum built up of the dwellings (Source: author).

Figure 12: Partial architectural model of the neighborhood segment. View from the top showing the buildings, their courtyards, terraces, and parking areas (Source: author).

Figure 13: Oblique view of the architectural model of the neighborhood segment. The view shows how the dwelling units cluster together creating terraces for each unit that are designed not to overlook the private areas of adjacent units (Source: author).

Figure 14: Street in the village of Sidi Bou Saïd, Tunisia, 2007, showing the use of the Fina for planting vegetation in the trough that enhances the quality and ambience of the street. Further, down the street the Fina is used to place removable plant pots (Source: Beschreibung).
4. **Community Center** (see Figure 15): The layout is directly influenced by the intricate and interesting physical configurations and mixture of uses found typically in the central areas of traditional towns and settlements. The orientation of the mosque and its Qibla wall versus the general alignment of major streets, which affect the planning of the neighborhood as a whole, provides a challenge for creating interesting spaces in this area. Major facilities include the mosque for the whole community, a public bath/health facility, shops of various sizes, a restaurant, two separate primary schools for girls and boys (assumed to be the preference in some communities); each can accommodate 200 pupils in six classrooms and adjacent open play fields. The Community Center covers an area of 2.5 hectares, including parking, vehicular access, open spaces and play areas. A number of considerations including for example the stipulation that the maximum distance from any shop to its service parking area is 50 meters governed its design.

5. **Prototype Neighborhood** (see Figures 16): The concept as presented comprises four neighborhood segments and a community center, covering an area of 17.6 hectares that includes 428 dwelling units, traffic and pedestrian circulation, parking and open spaces. Vehicular circulation is based on a hierarchy of four types: Arterial roads, Collector roads, Feeder roads and Access streets. Other streets are primarily for pedestrians and also follow a hierarchal concept as evident in the plans. The neighborhood as a prototype is responsive to repetitive growth in a variety of ways and in response to different contextual site requirements such as those found in the suburbs, in urban fringe areas or urban areas.

The gross density of the whole prototype neighborhood, including its community center, is 24 dwelling units/hectare. The density without the ground coverage of the community

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**Figure 15:** Community Center plan showing the distribution and location of the various facilities that are included (Source: author).
center is 28 dwelling units/hectare. The public domain is 55% of the total area of the prototype neighborhood that includes all streets, parking, community center, playgrounds and opens spaces. The private domain is 45% of the total area that includes all dwelling units and cul-de-sac access.

**Conclusion**

The purpose of this test design, as was mentioned at the outset, was to find out through design inquiry whether or not we could recreate the desired qualities of traditional environments as those found in most regions of

Figure 16: Prototype Neighborhood: (right) Circulation & Open Space Systems that also show parking locations, and the footprint of the built up areas, and (left) Roof outline of the built form (Source: author).
the Mediterranean. Every year those locations attract vast numbers of tourists from many countries. The evidence seems to suggest that there is a unanimous feeling among most visitors, regardless of cultural background, that those traditional built environments do offer an attractive setting for an alternative life style, and conjure up a strong feeling for a sense of place not easily found or experienced in contemporary environments.

This test design, therefore, can provide us with the opportunity to evaluate rationally its built form results in terms of qualitative and quantitative attributes and accordingly be able to consider its outcome, or its possible derivates, as an another viable alternative to our contemporary habitat and settlement patterns.

**References**


Nijst, A. et al. (1973). Living on the Edge of the Sahara: A Study of Traditional Forms of Habitation


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SMYRNA STUDIO
TEMPORAL AND URBAN PERIPHERIES IN SYSTEMS THINKING

Gudjon Thor Erlendsson and Gul Kacmaz Erk

Abstract
The “Temporal and Urban Peripheries” is the fall project of the final year of the Architecture program of Izmir University of Economics in Turkey. With a critical and contextual look at the built environment, the studio focuses on the significance of the incorporation of history, urban design, and parametric architectural design. This short article presents the thrust of the studio, basic concepts, the process, and outcomes.

Keywords
Architectural design, parametric design, urban design, digital tools, history.

Introduction
Izmir University of Economics has a four-year Architecture program founded in 2004 as one of the five departments of the School of Fine Arts and Design. In search for a digital/parametric design approach to architectural education, Gudjon Thor Erlendsson, Gul Kacmaz Erk, Serdar Asut and Can Gunduz have generated a senior studio project entitled “Temporal and Urban Peripheries” in 2009. The 15-week studio took place between September 2009 and January 2010 and focused on historical, urban and parametric design. In this article, we comment on our experience of tutoring an experimental studio with almost 50 students.

Digital Crafting
We primarily use Rhinoceros NURBS modeling and its Grasshopper plug-in. Within the methods of “digital crafting”, the product of the semester is a tangible architectural project in which “digitally” depends on the individual student. We encourage students to explore the “diagram” of the digital tool(s) (or the apparatus/apparata in Vilem Flusser’s terms).
Through the opening up of the techno-scientific black boxes, digital craft becomes the skill objective of the studio. The digital tools (such as parameters, algorithms, and codes) need a new way of thinking and communicating with design tools. The more designers become digital craftsmen, the more the tools become idea generators. The tools work on the principle of interconnections. Forms can be created using algorithmic mathematics, and design elements can be inter-linked, making each model automatically responsive to both local and global changes. The process is therefore based on non-linear input, flexible process, and adaptive formal output. This method is known as “causal loop” in “systems thinking.”

“Systems thinking” is both a tool for problem solving and a universal paradigm or philosophy. It views situations and behaviors as a part of an overall system rather than isolated problem-solution methods (Weinberg, 2001). As such, it poses a counter point to immediate reaction to frivolous pseudo-agendas of the day.

The studio uses contemporary and traditional architectural tools for “digital crafting” to produce future design anchored in a historical urban context. The aim is not to replace the pen with the computer but to use the logical concept of “systems thinking” to develop architectural design projects. The term “craft” here refers to the skills. Proficiency at these skills comes from the understanding of their nature. The digital tools have been utilized for all phases of design, from conceptualization, through analysis to production. Further reading on this topic is available (DeLeuze and Guattari, 1987; Koolhaas/OMA, 1995; de Landa, 2000; Schumacher, 2009).

**Temporal and Urban Peripheries**

While exploring the overall idea of designing both in a physical and cerebral historical and urban context, the studio explores the idea of the periphery. Periphery as a condition can be a limitation, and/or a probability or connectivity. It can be the outer limits or edge of something, a marginal situation, or a spatial periphery. At the same time, it can be the node of connectivity between one domain and another, an opportunity that offers new amalgamations.

Upon completion of the studio, students have come away with a better understanding of the idea of seamlessness and context: how a building and the (urban) environment, and the past, present and future, are inseparable conditions. This seamlessness is a driving concept in “systems thinking,” where constructs are defined by their dynamic relationships rather than as unchanging singularities in isolation.

Modernism is a theory of hierarchical categorization. It separates functions into zones of analogous characteristics. Modernism largely rejects the past in favor of the creation of the new. It forms a historical boundary, pre- and post-modernism, which has not been successfully re-balanced without appearing kitsch.

The studio presents an anti-thesis to this historical periphery, to suburbanization, zoning and the internationalism of the modern movement. The studio notion of the periphery embraces the aim of bridging this boundary: A contextual Aegean future vision based on the past, minus the kitsch.
Izmir, being on the western border of Turkey, sits on the ancient city of Smyrna (now in the district of Bayraklı). Smyrna is a historically important Aegean city that dates back to 1102 BCE. The location for the project site is in and around Old Smyrna, which is now an archaeological site (see Figures 1-5).

What are the reciprocal cultural and historical affects of the periphery in Smyrna, Turkey? The present is a periphery of the past, the edge of history, and at the same time the beginning of the future, the “now” is therefore a “temporal periphery.” The “now” is a condition that perpetually presents an opportunity for a connection between the past and the future.

Project Analysis
Initially the students take part in a two-week workshop where they explore the use and
possibilities of digital tools. The students familiarize themselves with Grasshopper for Rhino and complete a small installation project using digital platforms.

The students begin their principal project design by gathering information on historical topics related to the site, including historical maps of Smyrna and surrounding area as well as historical building types in the Aegean and Anatolian regions from diverse cultural periods.

The students then proceed with an urban analysis of the site. The analysis is developed diagrammatically and formatted through dissection into a conclusion for a strategic approach to the site. This includes flows of traffic and pedestrians, placement of attractors, overlaying of historical maps, and historical building and space types. The immediate use of digital methodology for research later matures into digital design production.

Based on the historical site analysis and/or selection of specific time period, the students develop a parametric component for their buildings, which is based on historical design approaches such as peripheral conditions, (public - private) space types, screening/wall types, cultural concept of art and spatial sequences.

The components developed range from a cladding system to a structural logic, or spatial sequence, which is ultimately applied to an overall project design. The components deal in different ways with edge conditions. In some cases a “wall” to explore the historical connections and deal with environmental factor such as sun, rain or wind. Most of the work questions the meaning of such conditions; wall and/or an opening, threshold, gate, exit, boundary, edge condition, etc. as a private, urban and historical construct.

**Principal Project Design**

Production output during the design development includes 3-D modeling, physical modeling, parametric definitions, and presentation output. These have to demonstrate the design process in each stage and lead to a completed design. The
scale of the projects is fixed to a building or an interdependent cluster of buildings. The building should revert an identified negative situation, while at the same time integrating into the context and presenting something new to the historical environment of Izmir.

With the combination of site analysis and the component design, the students demonstrate one of the fundamental ideas of parametric design where the internal (component) and external forces (context) are integrated. Each

Figure 6: Bayrakli site model by students (Source: Gul Kacmaz Erk).

Figure 7: Analyzing ‘agora’ for her component design, Irem Cabbaroglu finds the form of her community center and archaeological park intersecting Athena Street of Old Smyrna with the new streets of Bayrakli (Sources: drawn by Irem Cabbaroglu).
of the 49 students of the studio chooses his/her own site for a local and a global program as well as an urban solution. The proposals show an understanding of the context both in terms of the urban situation, links to wider context and the temporal periphery. The students are reminded at all stages that history is the main notion of the studio and they should demonstrate with their proposals how they deal with the existing peripheral condition between Old Smyrna and new Izmir (see Figures 6-13).

Figure 8: To link the ancient ‘port’ of Smyrna and the new port of Bayraklı, Asli Caglyurt designs a linear water sports center on an archaeological park along the canal (Sources: drawn by Asli Caglyurt).

Figure 9: By the canal, Pelin Dogan designs a conference and community center, the layout of which is based on her analysis of ‘megaron’ (Sources: drawn by Pelin Dogan).
Figure 10: Ozge Hazer combines a horizontal art gallery with a vertical mass of affordable housing through a component based on ‘street’ design (Sources: drawn by Ozge Hazer).

Figure 11: Ece Uyar’s urban approach consists of a secondary route parallel to the main pedestrian shopping street of Bayraklı with nodes of sub spaces and a small art gallery and trade school, the façade of which is designed as to her analysis of ‘bay window’ (Sources: drawn by Ece Uyar).
Figure 12: Ozan Yeniay demolishes the contemporary high-rise apartment blocks for an archeological college and community center interpreting ‘imperial forums’ for form finding (Sources: drawn by Ozan Yeniay).

Figure 13: Pinar Yuksel studies ‘mud brick wall’ for the parametric façade of her affordable housing and archaeological park (Sources: drawn by Pinar Yuksel).
Successes and Failures

Although the studio paradigm is founded in traditional architectural design methods, the theoretical side of digital crafting demands a different way of thinking. This proved to be challenging. While one half of the studio made the paradigm shift necessary, a large portion of students were not able to do so and their work suffered as a consequence.

The approach to history was twofold; as a reaction to the context of a globally important archaeological site, and as an idea based on the analysis of a historical approach to the built environment. This was very successful in general and unearthed interesting information and approaches. Although the idea of the periphery was central to the studio brief, the concept was not explored as the backbone of the studio. This is mainly due to the lack of emphasis by the studio and the amount of other information the students had to process.

The urban analysis, although not a primary focus, became an important factor in the contextualization of the projects. As such, it was a good exercise and the students will use this know-how in their graduation project in the spring.

One of the best results from the studio was how much the students learned about their city. This is a useful background for whichever endeavor they chose to pursue in the future.

References


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ARCHITECTURAL EDUCATION IN AFGHANISTAN: EVOLUTION, CHALLENGES AND OPPORTUNITIES

Abdul Wasay Najimi

Abstract
As a component in higher education in Afghanistan, educating architects to steer the country’s conservation and planning of built environment is crucially needed. To raise the technical capacity for professionals working in built environment related fields in Afghan cities, higher education in architecture commenced at Kabul University (KU) with support from USAID in 1968 and the first group of Afghan academic architects graduated in 1973. Despite having a good standard, ten years later as part of the Engineering Faculty, the Department of Architecture degraded when the Soviet backed regime looked at it objectionably after 1979. Supported by the former USSR, the Kabul Polytechnic Institute (KPI) as a favorite alternative school initiated architectural education in 1980. This paper studies the process of educating architects in Afghanistan from the pre-war era and up to now. Limitations and opportunities in view of educating young architects for current and future conservation activities and development of the Built Environment in Afghanistan are examined.

Keywords
Afghanistan, architecture, architectural education, built environment, higher education.

Introduction
Construction sector has been the major labor-intensive employment opportunities in Afghanistan, in view of the fast transformation of the built environment in cities and the uncontrolled expansion of the urban area through the past ten years. This has attracted young students into civil engineering education available in the major cities. Architecture is not much known to the pre-university students; nor do they have much awareness about the built environment issues exist. Only Kabul University (KU) and Kabul Polytechnic University (KPU) offer five years architecture programs and have some 340 students. Still, the architecture departments operate under the engineering colleges. Teachers are mostly young and few are exposed to similar studies abroad. Research and publication is rare. Resources are limited and the supporting management is poor. However, all admit that qualified architects and planners are much needed.

The Beginning
To bring about a planned built environment in cities of Afghanistan, the first construction code...
was drafted by help of European engineers in 1920s, when plan for a new city of Kabul was initiated. During 1930s-40s a craft school trained young students in various branches of construction: design and detail drawings, estimation and supervision of construction site and craftsmanship. Such training was at a high school level. KU was established in 1932 (Kabul University, 2011), but education in architecture started in 1968, supported by USAID (Najimi, 2007; Layon, 2010). After the cycle of five years training the graduates earned a B.Sc. Arch degree. Among the first graduates in 1972-3, M. Sarwar Azad and Bashir A. Kazimee were hired as teachers. Kazimee is Professor at the Washington State University, Pullman WA and author to many publications in architecture. (Kazimee, 2008).

While in Europe and USA “traditionally a school of architecture was preparing for the profession of a self-employed architect, being legally reliable for his or her projects” (Neuckermans, 2001), in Afghanistan the school of architecture was preparing architects to work for the government. Many architects also had secondary jobs in consultancy offices in the evenings and designed reasonable buildings.

**Faculty, Capacity Building**

Having American teachers, studies in engineering and architecture at KU was based on curriculums used at American Universities. Different programs like Fulbright Hay Scholarships and the USA’s Peace Corps Volunteers supported the Program. American teachers taught and mentored young Afghan faculty. Top graduates were recruited every year to build up the academic capacity.

Job at the higher education institutions was well liked; university professors and students enjoyed the respect of the bureaucrats and ordinary people alike. The teachers were committed. They took pride in their job, and spent considerable time in working with students and studio sessions. In 1970s, the department of architecture had faculty educated in many different countries: Afghanistan, Austria, France, Egypt and USA. No female teachers came into the team, however, except when an American art history field-researcher offered a course in history of the Gandahara (Greco-Buddhist) art in Afghanistan in 1975 (Klimburg-Salter, 2010). This course was influential in making some students, including myself; pursue higher education in architectural conservation.

**Architecture Students and Gender**

While students were mostly male some classes included one but never more than three female students. There were about eight to ten graduates annually. In 1977, President Daud for building extra technical capacity for his planed developmental projects commissioned the universities to accept freshmen six-fold; more than 700 freshmen were admitted into engineering at KU and therewith beginners in architecture education also increased—allowing more female students enrolment during 1977 to 1980.

The graduates of the technical high-schools like the Afghanistan Institute of Technology (AIT) having courses in building construction and technical drawings had a better technical foundation for onwards engineering and architecture studies.

**Curriculum, Text books and Resources**

Architecture Curriculum was a five years education. Being a department within
the Faculty of Engineering, its architecture curriculum was “with a strong emphasis upon building science, particularly structural design” (Lewis, 2009). The shortcoming in the curriculum, for local application, was that it not covered history of architecture in Afghanistan itself as part of the history course. Heritage and conservation was missing too. Students therefore knew little about the references to archaeology, architecture and art history of Afghanistan. To an extent, this helps to explain why most Afghan architects and engineers even today have a limited understanding of the issues around conservation and seem to have few qualms about transforming or even replacing historic buildings, introducing new buildings or driving new roads through historic urban neighborhoods. In these actions, they seem to draw on the models of modernity that they saw or read about elsewhere in the region or further afield. In fact, their vision differed little from the mentality that prevailed in post-war Europe, where immense damage was done to architectural heritage in the name of reconstruction (Najimi, 2009).

English language was the medium of instruction, until 1978, and text books were all American products. This sometimes made it difficult for students from provinces to cope with the situation. Also printed material and references for architecture were not available in local languages. The university library was the only campus-based reference resource. Equipments facilitating visual presentation in lectures like history of architecture were the traditional slide projectors and book-overhead reflectors.

Design projects, Studio Sessions and teamwork

The emphasis of the architectural education was more on creating buildings in a modern built environment. Teachers were focused on teaching students how to plan and organize spaces for a specific use every semester, starting with a family house, institutional and commercial buildings; and understand the structure based on modern material. Concrete as a material for construction was more known as the architecture students shared lectures and lab in structure and concrete testing with students of civil engineering.

Based on a full day schedule: lectures were planned in the morning hours and afternoons were allocated for studio sessions in sketching, design and drafting, following the pattern of “atelier-based training” (Kuhan, 2001). Students of different classes shared the same and large studio space enhancing a good peer-communication and discussion. The studio hall was also active in the evenings, and sometimes the night, especially when students worked in groups and to complete hand made presentations. Female students, obviously restricted culturally, stayed until sunset only.

Education through Research and Field Work

Professors coming through the Fulbright-hay Scholarship Program helped carrying out research oriented teaching and exposing students to Afghan vernacular architecture. (Hallet & Samizay, 1980; Szabo & Barfield, 1991). No doubt that architecture students needed to get exposed to their surroundings, know the historic city and neighborhoods, civilization and culture. Design concepts and construction details worked out in the historic buildings, urban patterns and natural landscape have been varied in different parts of the country.
Field trips played a major and important role as stressed by scholars (Khan, 2011; Sahlberg, 2011). The “Instruction and application” (Yatt, 1993) methodology as part of teaching activity was found well strengthened. Both teachers and students were inspired for further academic work.

**Inspiration and Academic Follow-up**
Valuable academic works were published on the housing in old city of Kabul and Afghan villages. These have become major references for scholars and students later on. Teachers and students having gained exposure through the researches and field works above discovering the riches of the vernacular architecture of Afghanistan continued similar research through their higher and postgraduate studies abroad. (Samizay 1974; Kazimee, 1977; Taheri, 1980; Najimi, 1988).

**Coordination and Mentoring**
The small team of architecture faculty allowed for an effective coordination in teaching and research activities. A faculty developed as he taught individually and independently, partly because the few teachers had to cater for the many courses offered each semester. “Coordinating their teaching while working autonomously” (Dill, 2003) allowed the professor lecturing on design students know what the professor lecturing on structure, or the history of architecture was teaching to the same students.

Through a “Centre for Engineering Consultation, Scientific Advices and Applied Research” (CECSAR) the faculty initiated a consultancy service in 1977; where both faculty and students participated in design and production of working drawings. Applying their theoretical approach into practice they also benefited from some financial remittance. USAID and other donors to Afghan government used such services for projects they funded as the ministries oversaw the implementation by private contractors. Despite all such success this architecture school faded out in the name of the revolution of 1978.

**The Turning Point, Degradation, Soviet Invasion**
The Coup d’état of 1978 was a turning point in Afghanistan modern history. The new government favored Soviet model of governance and academic institutions. A Soviet educated professor from KPI was appointed as the deputy dean of the USA modeled Faculty of Engineering. Political loyalty to the regime weighed more value compared to a student’s professional qualification and performance. Students functioned as informants and
professors were in trouble if they differed with the system. In 1979, the medium of instruction changed from English to Dari and Pashtu (national languages).

The December 1979 Soviet invasion of Afghanistan changed the situation further. Soon it was decided to plan closure of the architecture (and engineering) at KU and instead commence an architectural department at the Soviet modeled Kabul Polytechnic Institute (KPI) in 1980. There, Russian language was the medium of instruction but for the early classes lectures and notes delivered by Russian Professors needed to be translated by Afghan assistants into one of the two official languages of Afghanistan.

**Brain Drain, Immigration**

Due to political decisions above, architecture program at KU faced downfall in 1981. Admission was no longer open to new students by 1983 and with the graduation in 1985 the door of the Department of Architecture was permanently closed (Layan, 2010). Many students abandoned their education and left the city for fear of imprisonment, forced military services and many emigrated. Professors too sporadically left the country and sought asylum at western countries. For those loyal to the regime, KPI was the favorite engineering school to send their children to; faculty and students

![Figure 2. Architectural education in Afghanistan and events during the 40 years since its inception.](Source: Author, 2011)
were sent on scholarships to former Soviet Union universities. Architecture program at KPI run as a department under the Faculty of Civil engineering/construction. The curriculum was probably compared to that of KU but inspired of a Russian/European model of 1970s, with a final semester for Diploma project and graduation equivalent to M.S. Degree. In contrast to the academic research work undertaken at KU in pre-Soviet era, not much of Afghanistan related research work is known being done at KPI. According to the graduates, no specific textbooks were used and teachers prepared notes and handouts.

The focus was on designing rigid multi-storey buildings with concrete structures: apartments, hospitals and commercial blocks. [Figure. 3] Plans and site plan arrangements were inspired by what was indicated in the Soviet prepared Master Plan for Kabul City in 1978. Concrete made the favorite building material and a three meters bay a favorite module for the reinforced concrete columns in most commercial and mix-use buildings. Traditional building material and vernacular architecture of Afghanistan was only used in self-made housing and in informal settlements.

Across the border in Pakistan, at the refugee community in Peshawar, a number of Afghan professors joined the non-governmental institute of Dawat University that since 1989 offered training in architectural and engineering studies to Afghan refugee students, whose service was needed in works by NGOs projects in the liberated parts inside the country supported by international donors. Others sought refuge in Australia, Europe and USA.
Rehabilitation of Architecture Education at KU
After the Soviet withdrawal in 1988, President Najibullah’s government as a reconciliation attempts rehabilitated the Engineering Education at KU in 1989. Although with very limited resources, some teaching activities were initiated in 1990. While few more universities were established in the provincial cities (Herat, Kandahar and Mazar-i-Sharif) architectural education was only offered at KU and KPI. Kabul’s inter-fractional war in 1992-96 devastating much of Kabul city hindered all sort of education until 1996.

Repatriation: From Peshawar to Kabul
As an act of supporting the Kabul government, Benazir Bhutto’s government in Pakistan pushed the NGO and Afghan refugee institutions to move to Afghanistan to enhance the repatriation of Afghan refugees. Architectural students of Dawat University, moved to an inadequately shelter in a former government farm in Jallalabad in 1995 and then to Kabul in 1996. Taliban advanced to Kabul soon after. With exception of medical education, female students were not permitted to continue universities. “During the Taliban rule, the Faculty of Engineering at KU functioned but had very limited academic and financial resources” (Layan, 2010). Some students of Dawat University joined up the KU architecture program. A number of the teachers of architecture in Kabul today are graduates of that era.

Damages by Politics and War
In Afghanistan, damages due to war and in result of political instability, ineffective governance, people’s indigence and immigration has been enormous. In addition to the huge loss of lives, shortages in human working capacity are severe in all fields, especially when a rapid and uncontrolled transformation of cities and towns taken place in Afghan cities have brought up many challenges in the Built Environment. On human scale there has also been damage to people’s self confidence and coping mechanism.

Confused Title: Architect or Engineer?
Professional titles are used to signify a person’s professional qualification, role or to designate membership in a state body, professional society etc. Afghan architects educated within the Faculties of Engineering can be confused: Architect or Engineer? So or the clients! As civil engineers attempt to also do architect’s job, in ordinary building and residential projects, the client cannot distinguish between an architect and an engineer. In Afghanistan all architects are commonly addressed as “Engineers”.

Few may realize that “teaching architecture is, in many ways, a distinct profession into itself.” The teachers may also overlook that “the skills and experience required for both practicing architecture and teaching it is often complementary, but also somehow different” (ArchVoice, 2009). Given the disruption of systems of higher education during the long conflict, from which academic institutions are still struggling to recover, the undergraduate courses provide young Afghans with only the most basic technical and analytical grounding, which arguably does little to prepare them for the challenges that they are likely to face in their professional careers (Najimi, 2009).
Post-War Reconstruction, Education in Architecture

No one doubted, with the sudden international interest in Afghanistan after the fall of Taliban, that the time was right to have a new beginning in Afghanistan’s post-war reconstruction. Since November 2001, both the Afghan government and its European mentors put Afghanistan’s reconstruction a priority. Donors pledged and contributed to various and relative upgrading of the survived built environment in the capital Kabul and few other cities. International companies arrived and have worked as building contractors mainly to the US Army Corps of Engineers (AED) and the International Security Assistance Force (ISAF) building army camps, garrisons, security bases, police installation and air fields etc. All, contractors and subcontractors needed to employ young afghan professionals; architects and planners may have had fewer roles in such works, but could quickly get a job. The international seminar “Kabul & the National Urban Vision 2002” in Kabul emphasized the need for many more and better qualified architects and urban planners. “There is an urgent need to ensure that the process of urbanization in Afghanistan will be sustainable and to maintain a balance between rural and urban development. It is also important to

Figure 4. Typical owners imposed concrete building within the historic part of Kabul Old City. (Source: Author, 2010).
ensure that the development of Kabul preserves heritage sites and green spaces in the city,” President Karzai marked in his addressing the conference (UN-HABITAT, 2002).

Kabul Polytechnic Institute got promoted to a university; KPU and KU resumed programs in architecture education; female students returned to complete their education disturbed earlier.

The question still remaining has been whether these departments are successfully educating architects? Vision, planning, organizing, leading, and controlling are understood to be the internal factors leading to better results in a school management. KU and KPU being active for the past ten years are yet to correct the many shortfalls and meet challenges faced in the architecture education in Afghanistan; that needs to be addressed as in-campus and out-campus factors.

The On-Campus Challenges
Lack of Vision, Little Capacity and Enthusiasm
In 2002, a former faculty, professor of architecture at a USA university, proposed a plan to reform the architecture department at KU. He advocated upgrading the existing program into a college encompassing architecture, conservation and environmental studies. The leader/chancellor of the university (a professor of agriculture) and the dean of the Faculty of Engineering (a professor of electric engineering) overlooked this opportunity. Potential donors were at sight, but the management could not envision it. Ten years after the rehabilitation of the department and despite it being in partnership with Kansas State University between 2007-9 where some four faculty went for master degree education, today a teaching assistant (Pohyalay) is chairman of the department of architecture at KU.

Comparing the ten years span of architectural teaching in 1970s to the decade long recent period one finds that the latest program management has been very poor. Little has been worked with teachers’ pedagogical capacity. Teaching hours are making 50-55% of class hours in 1970s. Like in many universities, both KU and KPU, tend to assign junior faculty to freshmen’s class. Often the talented freshmen get discouraged as much as the weaker student may not learn easily. Classes are run from 8 am to 13 Noon.

Curriculum and Qualification
The rehabilitated architectural program at KU had used a version of the 1970s curriculum. The last group of students educated on the basis of that curriculum was graduated in autumn 2011.
Kansas State University (KSU) advised a new curriculum in 2007 (Watts, 2008; Lewis, 2009; Azizi, 2010). Few of the faculty is objectively trained to live up to the contents of the new curriculum. While titles of some courses are renamed the new curriculum still offers a Bachelor of Science in Architecture (BSc. A.) degree after 5 years education. In the same college civil engineering is done in 4 years. All are however called “Engineers” in public.

While the final project (graduation project) at KU is like a semester exam in design course, at KPU it is considered as the “Defense of degree” session of the candidates for graduation. One or two visiting professionals are invited to attend as jury.

Staffing and Gender
In 2010-11, the Architecture Department at KU had nine male and one female teachers, graduates of the department itself; four of them have MA from Kansas State University USA (KSU), one had MA from India. A faculty has PhD level qualification in earth architecture form Germany, but has little influence in the department. The faculty at KU is young and not specifically trained as teachers. “Relying on memories of their own education, [mostly during the period of instability] they are dealing with the “traditional design project” (Weaver, O’Reilly & Caddick, 2000). In comparison, the
architectural department at KPU has twelve teachers (Afghanistan Cultural Profile, 2011). Only one is female (now an office-holder in the ministry of higher education). Ten teachers are MA; one with degree from London, four from Czech and Slovak republics. The rest are KPU educated and with higher education in the former Soviet Union.

Perhaps unusual in other universities, at Architecture Departments of KU and KPU the faculty is a team of either class-fellows or one being formerly student to the other. This relationship is making the junior staff suffer from indebtedness to their seniors and lack confidence causing restraint in department discussions. They may disagree on issues but do not confront each other’s reasoning or lack of performance and accountability.

**Teaching Accountability and Performance**

While both teachers and students understand “design” as the main subject of Architecture, innovation in design, learning and examining design principles, spaces and socio-cultural concepts are limited. The “Design students are interested on learning how to illustrate the details of a window and its related design vocabulary, rather than strongly focusing on design principles and vocabulary” (Azizi, 2011). Regionalism (the use of material, the architectural form and the local environment) and cultural aspects related to design practice are not much focused on.

While fluency in the visual language of drawing is necessary in communicating design, these days, hand drawing is not practiced much and students are extremely poor in hand drawn presentations. Both teachers and students focus on learning computer software. Teachers themselves are not mastering sketching, “students think that the trends have changed and there is no need for freehand sketching anymore” (Azizi, 2011). Students sometimes take courses outside the university. However, use of computer for graphic works is not adequately mastered either. Some students presenting their graduation projects in the last couple of years have produced computerized 3D illustrations commercially. Different teachers evaluate students differently. While one would count grades of tests and homework in addition to the course’s end exam others might only judge students performance based on a final exam. The assignments in design are assessed by a review of their design work (drawings) and graphic or power point presentations in front of the course teacher and their classmates. Occasionally other faculty, visiting professionals, and interested students also attend. Grades are given by the course teacher.

Young teachers’ capacity building has been a priority. External volunteers have assisted in teaching since 2001, but neither the ministry of higher education nor Kabul University have yet acknowledged their service as a resource. A formal mechanism to manage the external volunteers, part time teachers and visiting professorship does not exist. The faculty in general is not well equipped with the “necessary pedagogical preparation” (Weaver; O’Reilly; and Caddick, 2000). Little is observed that young faculty engage to learn from the senior volunteers or visiting scholars. And, when a faculty is away, sometimes for weeks, other faculty does not seem to cover the classes.
Secondary Jobs
Illegal for their civil service-employment contract, most teachers have secondary full time jobs. Either they work for construction firms or have a small business themselves, mainly in army related projects. Their enterprising interest is stronger than their motivation for academic activities. They argue that “architecture professor can earn five to ten times less than working for an engineering firm and construction company” (Azizi, 2011). This perception has pulled them to work less for the department and more for their private engagement outside the university. This unfortunately leaves little room, attention-span and energy for teachers to concentrate on their prime job as architectural educators. The university management often overlooks faculty’s absence, a legacy prevailing among civil servants since mid 1980s. There are faculty who ploy students with weeks-long assignments but no interaction, especially in their elective courses. No student has ever failed such a teacher’s course.

Pedagogy and Architectural Education
“Young professors do not receive any formal training [in pedagogy and teaching skills] to prepare them for classroom teaching” (Azizi, 2011). Obviously, they express limitation in teaching a course they have not taken themselves. While internationally “a new wealth of ideas and debates cantering on educational reform” (Dutton, 1987) has lately developed, architectural educators in Afghanistan lag behind or perhaps not read the literature. Given they were interested; mentoring for the young faculty is not available. Little is recognized in terms of studio pedagogy and architect’s studio culture. Over-powered by family issues and commercial engagements, the faculty often lacks research and scholarly activities. They have not published much. “Lack of infrastructure and systems within the university is another challenge... Most semesters begins and ends at indefinite times” (Azizi, 2011). This makes the educational planning calendar much unsteady.

The university being traditionally a venue for scholarships abroad, many might have joined the rank of faculty, less for academic interest but more for awaiting opportunities abroad. The faculty’s exposure to internationally accepted architecture education and, “limited creative teaching approach” (Lewis, 2009) are obviously major challenges. “Most current architecture professors at KU were trained either under or after the fall of the Taliban [rule]. The challenge facing Afghan architecture professors in the Faculty of Engineering is in defining a methodology grounded in Afghan tradition and culture for the built environment” (Azizi, 2011). While only one of the Faculty officially has the rank of assistant professor, three are junior lecturers (in US university scale) all faculty in KU introduce themselves as “assistant professors” in their official correspondences.

Students’ Perception and Participation
Majority of the students are very talented and sharp. However, brought up to be polite and stressed by lack of infrastructure they are not actively participating in class discussions and debates. Architecture student usually complain of heavy load of study and project activities and time taken for making presentations ready (Common, 2011), but complaints shared by Afghan students of architecture are about absence of teachers and fear for missing opportunities in their youth and
education cycle. “Most subjects are taught without having a proper course syllabus. Lack of required discipline to be followed by students, professors, and faculty staff is another problem...Therefore, the numbers of horrible academic miscommunications, shortages and misinterpretations are huge” (Azizi, 2011). Students find themselves helpless in absence of a study adviser.

Although Afghan universities have since many years announced to follow a credit system (US model) many don’t apply it. “We made it simple for ourselves”, noted a faculty at KU, “we don’t have enough teachers”. A failed student has three chances to appear for exam, in a span of two weeks, also in design class. In contrast, the KPU practice in its own way the credit system; an eight week course is offered to students failing in a prerequisite-course to enable him/her to catch up the higher course his class fellows take in the semester being continued.

Absence of Female Students in Fieldwork
Segregated in schools, and high schools, boys and girls are setting in the same class in the university education. Being out numbered, girls engage less in class debates and argumentative discussions. Lack of confidence is observed when they present their projects in front of the class or a jury. Female students have little interest to visit and study architectural sites and projects in Kabul. The female students, making about 4.8% of all students in architecture and engineering, often avoid participating in a site visit, even when a course demands it. Some interesting archaeological and conservation works have been going on in Kabul Old City, Logar and Ghazni, but due to security consideration many, especially female students, would hesitate to visit. Luck of public transportation is one of the main obstacles for female students’ movement in Kabul city.

The Off-Campus Challenges

The Job Market in Afghanistan Today
The job market in today’s Afghanistan is dominated by construction companies working for the U.S. Army Corps of Engineers’ Afghanistan Engineer District (AED). While earlier most of the contracts were given to American firms, “as of December 2006, 70 percent of AED contract awards went to Afghan or Afghan-American firms. To date, AED has completed or has under construction facilities that accommodate more than 50,000 Afghan Army soldiers; and AED has completed more than 100 facilities for the police program, while working toward an end state of nearly 700 facilities” (AED, 2011). It is said that for their projects AED brings in pre-drawn CAD drawings that should be implemented for army and security installations; the consultant company or the subcontractors often adjust them slightly to the new site only. Other major projects in local market are done in Dubai or Pakistan, and for smaller projects or in the informal settlements many of the private investors “prefer to pass over the architect, when codes allow, and go straight to the builder” (Yatt, 1993).

Pre-University Students
Training in art and therewith free-hand drawings is very poor in Afghan schools. Curriculum at high schools covers little of history of art and architecture in Afghanistan, indigenous constructions, people and their lifestyle. The emphasis is more on math and physics that are
considered the main prerequisites for admission into engineering and/or medical education. The nationwide university entry-exam recently enlisted architecture education as a discipline, but students could not make difference between constructions engineering verses architecture. As freshmen of the Engineering education, “many students believe that architecture [is] accomplished in doing civil engineering skills in buildings” (Azizi, 2011). Their knowledge about, talents and interests in Architecture is not examined. Therefore, freshmen have limitations in sketching, technical drawings, cognition of space and visualization of shapes, perception of perspectives and proportions in aesthetics.

**Lack of Coordination between Architecture Schools**

Being only two schools of architecture in Afghanistan, there is no or little communication or coordination between them; teaching standard, methodology, resources are all different. The national level vision in architecture and architectural education is missing. While emphasis is more on buildings construction little is covered in terms of teaching and discussion about the built environment, a balanced conservation and development.

**Inadequate Consultative and Management Support**

“Many regulations set by the University and the Ministry of Higher education are obstacles in speedy improvements of the academic program” (Layan, 2010). Ironically, numerous western based Afghan Diasporas have resumed higher advisory positions through the last ten years, also at the universities, but little is contributed towards an effective higher education. About 65% of the donors’ money

![Figure 7. Students in the winter course in conservation planning. (Source: Author, 2011).](image-url)
and 55% of national budget have gone into the military and security budget of the country. Non-military government spending is often limited, specifically investments in cultural, academic, and architectural education. Government offices like Ministry for Urban Affairs, Municipalities’ planning and building control departments barely interact with the universities and architectural faculty and students.

Lack of effective administrative structure and traditional bureaucracy is often a cause for disappointment. Similarly, lack of skilled and trained technicians have left the teaching facilities primitive, tainted and dusty. Some classrooms are often locked and keys misplaced. University gates are guarded by armed and lesser educated policemen who often aggressively check students’ and visitors’ entry in the name of security measures. Their evident lack of admiration of the faculty and students discourage all and depress their mood.

Opportunities

Despite all the challenges, there are some opportunities available that would benefit good training of architects in Afghanistan. These need to be examined as in-campus and external framework.

On-Campus Opportunities

Teaching at university has been a prestigious job in Afghanistan. Employed by the State, a University teacher is a government civil servant with long term job security. To their respect, and to keep the senior academic staff in the university, many senior professors reached retirement age but are still kept on job. Senior teachers enjoy a high social regard and professional autonomy in the universities. As ranked government official a faculty is facilitated with ‘service passport’ upon his/her travelling abroad. The faculty earn two salaries; civil rank-salary based on employment seniority and a supplement of an academic rank in the professorship scale. They are paid for twelve months while teaching for nine months. Therefore a university should be able to attract very qualified architects to teach.

A number of previous professors returning from their refugee life abroad have sat on managerial and advisory posts within the government departments and are respected as authority. This should be a good motivation for the young faculty envisioning opportunities in their future career.

Adequate Teacher-Student Ratio

The teacher-student ratio (Bandiera, Larcinese & Rasul, 2010) is important especially in a design class for student-teacher interaction in studio sessions and a better student performance. “Many universities look at it very critically”. (Crittenden, Norr & LeBaily, 1975) This ratio is only 8 to 25 students (1 to 4 female) in the architecture classes in Kabul. The freshmen in architecture program at KU were 24 students (only 2 female) in 2010. Total number of architectural students at KU is around 85; this makes an average student-to-faculty ratio of 10. Similarly, the number of students doing architecture in KPU is 240, organized in eight groups of maximum 30 students. Each group has at maximum 5 female students. Two teachers normally teach the studio classes and the practical sessions; the student-to-faculty ratio is around 15.
Better Libraries, Text Books and Internet Access

Text books and reference material, advised by KSU, have been supplied to the libraries of the departments and their umbrella institutions from funds by the World Bank through the Strengthening Higher Education Program (SHEP) in 2008. The US Army Corps of Engineers have also supplied some books to the library of the Faculty of Engineering at KU in 2010. The collection also includes original or photocopies of the publications on Afghanistan architecture researched in 1970s.

In contrast to the 1970s, when books and libraries were limited, today the internet has opened a wider window for both faculty and students to search for knowledge, inspirations and references. Afghanistan Centre at Kabul University (AKCU), Afghanistan Research and Evaluation Unite (AREU) and Aga Khan Trust for culture office in Kabul (AKTC) have some collection of books that the Faculty and senior students can use as reference and extracurricular studies. Students are bright, curious and are eager to learn. They contact professors abroad, study websites of other universities, but they need study advisors and mentors to guide them well.

External Opportunities

Realizing the shortfall of qualified local architects and professionals in planning and conservation some organizations has sympathetically allowed their senior staffs teach architecture and mentor young faculty. They also accept students for internship and some major donors have supported university partnership programs. When invited professional working in international organization will to deliver lectures to students. Arguably, donors, embassies and world-bank funds could be available once they realize the seriousness of an implementation partners.

Partnership with Other Universities

A grant of US$ 40 million became available from The World Bank, for Strengthening Higher Education Program (SHEP) initiated in 2005. Six universities in Afghanistan established partnership with universities in Europe and USA (Bank, 2011). The Faculty of Engineering of KU received its part of assistance from this grant in April 2007. “This assistance came in the form of a ten-year partnership agreement between Kansas State University (KSU) and Kabul University (KU). “The goal of the partnership [was] in line with the larger strategic plan of KU to raise university education to international accredited standards by 2015” (Watts, 2008). The outcome was the “new five-year curriculum for Architecture” (Asia-Link, 2009) and KSU professors mentoring the faculty in architecture (Watts, 2008; Lewis, 2009). As a capacity building exercise, a joint studio run by students of KU and KSU was undertaken in 2008. But the distance had a lot of limitations on communication that depended on IT technology (Watts, 2008). KSU trained four teachers in their MA degree, three supported by the World Bank Grant and another by a Fulbright scholarship between 2008 and 2011. But, interestingly, upon their return they re-occupied their secondary jobs outside the university, instead of concentrating on the improvements of the department and in raising the standard of education.

Having partnership with Slovakia University, KPU held an international conference and scholars from Afghanistan, Slovakia and others...
spoke on the capacity building in Engineering and architecture in Afghanistan (Asia-Link, 2009). Such activities attracted attention of the donors. Benefiting some French support KPU also has a Clay Building Research Centre (Profile, 2011) that has provided resources for books and scholarships for Afghan architects’ Master degree education in France.

**Support by Donors and Professional Organizations in Kabul**

Aga Khan Trust for Culture (AKTC) has through its conservation projects in Kabul contributed to architectural education in Afghanistan since 2002. Senior program staff and consultants have presented works, given lectures and taught courses in architectural history of Afghanistan, Planning and Conservation to students of KU and KPU. Students also have had access and visited the sites of ongoing conservation project (AKTC, 2005). Further, support has been provided by AKTC in creating a forum for discussion and debate about Architecture, urban issues and conservation mostly in the newly-restored 18th century mausoleum of King Timurshah, which provide a centrally located space in the core of Kabul city. This program has helped to develop awareness among counterpart staff and students alike, while exposing Afghan professionals to the varied international experience of short-term consultants who have volunteered to make presentations (Najimi, 2009). AKTC’s contribution also encompassed exposure of students to vernacular architecture in Afghanistan. Students are taken to the recently restored Bage- Babur (a Mogul garden in Kabul) and the restored historic houses in the old city of Kabul (AKTC, 2005). “Much of today’s building activity takes place in sensitive historic environments and architects are often engaged in redesigning existing buildings. It is therefore essential for students of architecture to be aware of the philosophy of conservation of historic and vernacular buildings. To achieve sustainability, the efficient use and reuse of built resources is crucial. In addition, traditional settlements constitute a very important part of the cultural heritage of every country and incorporate many bioclimatic elements. The detailed investigations of vernacular settlements, and the principles for their conservation and [adoptive] reuse, constitute some of the essential elements” in conservation and upgrading of the Built Environment (Philokyprou, 2011). Utilizing the internet facility, AKTC newsletters, relevant articles, stories and information on architecture, conservation and planning are regularly shared with the staff and students of the universities. (AKTC, 2005)

**Extra Curricular Education and Short Courses by Visiting Professors**

Supported with a grant from the US embassy in Kabul, AKTC has facilitated talks and lectures by visiting professors. A scholar from Berkeley taught a planning course at KU where a couple of KPU students also participated in 2008 (Calogero, 2011). During 2009 -10, AKTC seconded a fulltime senior staff to help and teach courses in Sketching, History of Architecture (also Afghanistan specific), Conservation and Architectural Professional Practice. During winter 2011, AKTC offered two certificate courses, each five weeks (above 50 hours) and numerous week-long short courses. More than 200 architecture students and graduates of KU and KPU have benefited. The different sessions focused on basic architectural education, conservation, urban planning, making cities work, etc.; also lectures were organized in...
photography, use of GIS in improving informal settlements, archaeology, and conservation of brick domes. Similarly, a summer course was organized in August 2011 in Urban Conservation / Design in Historic Cities. Lectures were given on history and architecture of covered bazaars in the Islamic world. The site of an historic covered bazaar “Char Chatta” burnt in 1840s in Kabul Old City was studied and students made proposals for adoptive reuse. The first Kabul graduate of 1973, now professors at Washington State University USA lectured and run a studio for more than 34 graduates and students.

Two teachers’ seminars were facilitated by AKTC in April this year. Curriculums of architecture programs in KU and KPU were compared and discussed. Also ways to share resources and arranging common courses were explored. Summer courses in 2012 have been conducted by visiting professors from San Francisco state university and Washington State University have given courses in Urban Planning, history of architecture in the Islamic world and urban design. On behalf of the students, the author would certainly appreciate scholars internationally to contribute to architectural education in Afghanistan.

By bringing in the Afghan faculty of 1970s, now Diaspora, the past is linked to the present; the lost resources are identified and facilitated to re-engage and assist building a better architectural education in today’s Afghanistan.
Figure 9. Group of students at Kabul old city houses as field visit. (Source: Author, 2011).

Figure 10. A Summer Course participant presents his project proposal. (Source: Author, 2011).
Conclusion

Ten years after the present engagement of US in Afghanistan, comparing the contemporary architectural education program in Afghanistan today to the decade of US support to architectural education in pre-war time, (35) years ago, it indicates that obviously the former was more successful. The main factor making the difference seems to be country-wide peace, vision and dedication of the academic staff and management skills of the program administrators. Architectural education has moved on internationally (Salama, 1995; 2010). Whether the KSU advised curriculum reflects such changes is not clear. But one can argue that the curriculum of architecture taught in Afghanistan should dwell on the realities in this country. One can still use the products of research done in 1970s as inspiration for architectural works and teaching today.

The document on Afghanistan National Development Strategy (ANDS) outlines its strategic vision to improving the quality of life of the people of Afghanistan through conservation of the nation’s resources and protection of the environment (ANDS, 2008). Although the document does not mention sustainable architecture or its education at all, but the statement should indicate conservation and improvement of the built environment and to educate people for this task. Historic Cities preservation, uncontrolled urban transformation, rapid informal settlement (UN-HABITAT, 2002) are the urgent issues for architects to work on and to prepare students and graduates for tasks related to Afghanistan Built Environment conservation and planning. The departments of architecture in KU and KPU not only need to coordinate their efforts and share resources but also to effectively interact with the public and private employers and donors like AKTC, TMF, UNESCO,
USAID, UN-Habitat and others funding projects for Afghanistan reconstruction.

The youth are national resources. Majority of the students are very bright and hard working. Through spending five years of their prime age in the university they should acquire the necessary skills to enable them for development leadership tomorrow. In reference to the charter of UNESCO/ UIA (UIA, 2005) the government of Afghanistan needs to seriously examine the academic capacity, style of engagement and requirements for quality higher education.

Perhaps it is better to bring in the scattered capacity into one body and set up the first School of Architecture, Planning and Conservation of Afghanistan. Extra-curricular courses, winter sessions and excursions have proved very beneficial to students and needs to be followed. Visiting professor Program should be continued and encouraged to enhance debate, exchange and innovation. While external funding would stimulate improvement, the university needs to be creative too. The old-way civil-servant employment of university professors needs to change and teaching should be more of an objective engagement of scholars and teachers. A mechanism for employing faculty with partial engagement in teaching should be introduced and paid for the time they teach. Women teachers should be encouraged as this would also encourage female students to embark on architecture and urban planning education, for the benefit of the Afghan community and people.

References


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Taheri, F. H. (1980). Urban elements of traditional Islamic cities. MIT (Cambridge, Massachusetts) USA.


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