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# International Journal of Architectural Research

Volume (6) - Issue (1) - March 2012

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## Architecture Planning Built Environment Studies

An International Fully Refereed Journal

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# International Journal of Architectural Research

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### 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.

Archnet-IJAR is truly international and aims at strengthening ties between scholars from different parts of the world with contributors and readers reaching across geography, boundaries, and cultures.

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Archnet-IJAR addresses academics, practitioners, and students of architecture, planning and interior design. It addresses those who are

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Unlike other printed Journals where contributors wait for periods that reach two or three years for their work to get published, the value of Archnet-IJAR as an online journal is that it eliminates the large lead time needed for publication. However, submission, referee, and publishing processes are strict and adhere to the following procedures:

Interested contributors contact the chief editor expressing interest, and submitting a summary of their paper. One page will do.

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Soon after receiving feedback from the referees, author(s) are contacted to submit their full papers.

When full papers are received, they will be forwarded to two editorial board members for blind review, according to the referee form.

The chief editor contacts the author(s) with the referee form filled by the reviewers. While papers will be blind reviewed, in exceptional cases author(s) will be asked to communicate directly with the reviewers.

Author(s) revise their papers as noted by the reviewers and re-submit their work to the chief editor.

Author(s) should make sure that their submissions should be free of jargon, clear, simple and to the point.

Papers will be published in the next issue according to the following schedule:

March 30th (publishing date): December 15th (deadline to receive papers after reviews)

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The name, mailing address, position, affiliation, telephone, fax, and email of each author must be supplied in a cover letter attached to an email. All papers will be blind reviewed and assessed by at least two referees.

### 2. Preparation of Manuscripts Layout

Manuscripts should be typed in double spacing on one side of A4 (21x29.7 cm) paper with reasonable margins (2.5 cm). All pages should be numbered consecutively.

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The first page of the manuscript must contain a concise and informative title; names, affiliations and addresses (including e-mail) of all authors, and identify the corresponding author (who will be responsible for correspondence and reviewing proofs). An abbreviated title of less than 50 characters (including letters and spaces) should also be suggested.

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Title of the paper should be written at the top of abstract without authors' name. A concise and informative abstract must not exceed 300 words in length, should summarize the objective, methods and major findings of the paper. Keywords must be carefully selected to facilitate

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Dutton, T.A. (Ed.). (1991). *Voices in Architectural Education: Cultural Politics and Pedagogy*, Bergin & Garvey, New York, NY, USA.

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

Salama, A. (1998). "Integrating Environment-Behavior Studies into Architectural Education Teaching Practices," In J. Teklenburg, J. Van Andel, J. Smeets, & A. Seidel (Eds.), *Shifting Balances: Changing Roles in Policy, Research, and Design*, EIRSS Publishers, Eindhoven, Netherlands, pp.128-139.

Salama, A. (2006). "Learning from the Environment: Evaluation Research and Experience Based Architectural Pedagogy," *Transactions, CEBE-Center for Education in the Built Environment*, Cardiff, UK, 3 (1), pp. 64-83.

Salama, A., O'Reilly, W. & Nochis, K. (Eds.). (2002). *Architectural Education Today: Cross Cultural Perspectives*, Comportments, Lausanne, Switzerland.

Sanoff, H. (1992). *Integrating Programming, Evaluation, and Participation in Design*, Avery, London, UK.

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Each table must be typed, and consecutively numbered. They should have a brief informative title placed as a heading. Tables should be understandable without reference to the text, but they should be referred to in the text. Explanatory captions should be brief and placed beneath the table.

### Figures

Figures should be numbered consecutively throughout the paper and identified with the authors' name and the figure number outside the reproduction area. Figures should be referred to in the text and should be placed within the body of the paper. However, all figures should be supplied in separate files as JPEG file format. Figure dimensions should not exceed 21x30 cm. Photographs should be used with restraint and must be of high quality. Explanatory captions should be brief, placed beneath the figure.

### 3. Submission Process, Copyright, and Originality of Work

Proofs will be sent to the corresponding author for checking. Proofs should be returned within one week of receipt. Authors should correct typesetting errors only; they should not add any new material to the paper at proof stage.

Please read the submission process and procedures, and copyright notes under the general outline of the ARCHNET-IJAR.

All correspondence should be addressed to the chief editor.

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# International Journal of Architectural Research

## Archnet- IJAR

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## PERCEPTIONS OF PHYSICAL VERSUS VIRTUAL DESIGN STUDIO EDUCATION.

Mahmoud Reza Saghafi, Jill Franz, and Philip Crowther

### Abstract

While the studio environment has been promoted as an ideal educational setting for project-based disciplines associated with the art and design, few qualitative studies have been undertaken in a comprehensive way, with even fewer giving emphasis to the teachers and students and how they feel about changing their environment. This situation is problematic given the changes and challenges facing higher education, including those associated with new technologies such as online learning. In response, this paper describes a comparative study employing grounded theory to identify and describe teachers' and students' perceptions of the physical design studio (PDS) as well as the virtual design studio (VDS) of architectural students in an Australian university. The findings give significance to aspects of design education activities and their role in the development of integrated hybrid learning environments.

### Keywords

Architectural teaching; Blended learning environment; Design studio; Online education.

### Introduction

Architecture can be considered as an exemplary model for the application and integration of different modes of learning due to the features of the design studio. Most of the activities that characterise university learning such as critical thinking, research, and professional education are evident in the design studio (Hashimshony and Haina, 2006) making it of relevance to higher education in general (Bose, 2007; Boyer and Mitgang, 1996; Hashimshony and Haina, 2006; Schon, 1987). At the moment however, this learning environment is not compatible with changes in society, higher education, and professional practice (Crowther, 2010). Reviewing the literature shows that the design studio faces similar challenges to higher education as a whole. Therefore, if a model is able to respond to the problems in design studio education, it will be applicable in many other fields of higher education.

This paper is a comparative study exploring the limitations and benefits of physical and virtual design studios. It employs grounded theory to identify and describe teachers' and students'

perceptions of their learning environments. It is expected that this study could explain the basic factors of studio learning environments to respond to the needs of comparing, analysing, and planning of new settings.

## Background

Learning environments in general have been faced with challenges about how to contemporise themselves and respond to the needs of 'digital natives' (Prensky, 2001). Bennett et al. (2008) describe 'digital natives' as active experimental students who have the ability of multi-tasking and who rely on digital tools for gaining information and for communicating with each other. This new generation of learners has changed dramatically. They are no longer compatible with our physical educational system, nor with our educators who are unfamiliar with their students' language (Prensky, 2001). Information technology is now seen as a way of providing students with more flexibility and enabling universities to position themselves more competitively.

Today, learning settings are decreasingly formal timetabled classroom-based and increasingly collaborative and socially peer to peer oriented (Fisher, 2004: 1). Participants share their knowledge and experiences and develop them through discussion and collaboration (Garrison and Vaughan, 2008: 17). Problem based learning, being closely aligned to constructivist theory, is very suitable for; team working, process focused learning, flexible programs, practice based learning, and interdisciplinary courses.

Dutton (1987: 16) compares design studio to a typical classroom and concludes that studios are active places where students are engaged socially and intellectually in various activities such

as drawing, communicating, and model making. Both Ecole Des Beaux-Arts and Bauhaus, as the leaders in architectural pedagogies for hundreds years, focused on the formal and technological aspects of architectural education and had little concern for cultural or social issues (Salama and Wilkinson, 2007: 4). Kurt (2009) concludes that reconsidering the physical design studio in constructivist terms will improve socialization and motivation. For this reason, design education should focus on the process of design rather than the end-product of design with the web-based design studio playing a major role in that education.

Graham (2006: 17-18) claims that face-to-face learning environments benefit from the strength of developing social presence, while at the same time suffer from limited time, lack of in depth discussion, and the participation of all members. Comparably, time and place flexibility, opportunity for participation of all learners, and deeper reflection, are dominant strengths of web-based learning. Wireless access to information at all times results in opening the classroom's walls and making long-life learning possible (Wagner, 2006: 42-44). Web-based learning has shifted the learning environment to a more social, flexible and personal space (Shao, Daley, and Vaughan, 2007: 918-919).

Design education needs face-to-face activities such as peer-learning and cannot be successful in a full online mode (Silva and Lima, 2008), as such, it is believed that VDS will not replace the face-to-face studio setting in the future (Salama and Wilkinson, 2007: 309-310). Virtual universities cannot exist without physical infrastructure, thereby requiring that future universities contain buildings and people enriched by virtual technology

(Elger and Russell, 2003: 674). Bersin (2004) argues that blended learning is the combination of an ideal teaching program for specific learners, and different learning media such as activities, technologies, or events.

The design studio, by its very nature, offers opportunities to examine the role of virtual learning and how it can be integrated with physical modes and methods. According to Bender (2006: 120) more research about the impact of online environments in architecture education is necessary due to rapid changes in design process, architectural practice, and students' expectations and behaviour. The aim is to incorporate the best features of face-to-face on-campus with online teaching to foster active independent learning and reduce on-campus time (Garnham and Kaleta, 2002). Unfortunately much of this has happened without any research to inform it or explore its potential.

Kingsland and Chen (1996: 2) conclude that students' feelings and motivation towards education may be influenced by the learning approach. Research about learning experience should therefore be concerned with the learners' views and the associated emotional aspects. Emotions have a significant influence on many aspects of the learning experience such as interpretations, actions, motivations, values, goals, and learner-teacher relationship (Austerlitz and Aravot, 2007: 242).

### Case Study design

Substantial parts of this paper are extracted from a PhD thesis where a case study was implemented by adopting Grounded Theory methodology in a comparative way. A pilot study was carried out as

the first step of the case study. During the second semester of 2009, an online survey was distributed among architecture students and educators of the school to identify their perceptions of design studio as their learning environment. At this stage, volunteers from the online survey were interviewed. Then the data were gathered for analysis and to inform the plan of the main study. A qualitative study was undertaken in the first semester of 2010. In the main study, an architectural design studio was constructed within the third year of the architecture program and a student group was elected to experience both PDS and VDS environments. This paper used the results of the pilot study and the initial analysis of main study data including the surveys.

### Participants and data collection

The required data in this study have been collected in two stages. Firstly, a pilot study was undertaken based on a questionnaire involving seven students and two tutors, and interviews with four of them. This then informed the major study involving eleven surveys and twenty two interviews in a case study. The pilot study was a good opportunity to revise the main study questions, tools, and approach, providing higher quality and rigor of outcome. In each stage, online surveys focused on comparing different aspects of learning environments, while semi-open interviews focused on delivering both educators' and students' experiences of the environments.

Twenty seven people participated in the case study, including three educators and twenty four students in two sub-groups. The online survey in the case study consisted of multi choices questions comparing some aspects of PDS and VDS at the end of the semester. Participants were asked to choose between PDS, VDS, or both, for

each aspect. Participants explained their answers during their final interview through reviewing their survey and commenting on the selected answers. The main purpose of designing the survey was to compare different learning activities, design studio aspects, and participants' feelings in both PDS and VDS through three-choice answers.

### Methodology

The collected data were analyzed using grounded theory methodology as outlined by Charmaz (2006). Data was separated, sorted, and synthesized through qualitative coding which occurs by attaching labels to parts of data (Charmaz, 2006: 3). Strauss and Corbin (1990) describe data analysis in a grounded theory approach as the process of separating, conceptualizing, and putting data back together in new way to evolve a different understanding of phenomena and allow a comparison between the elements of different learning environments of the case study.

#### The process of analysing data

The data for this study were managed and subjected to another level of analysis using NVIVO 8 software. NVIVO was used to facilitate the archiving, coding, and analysing of data as conveyed in Figure 1. The software enabled the formation of free and tree nodes similar to open and axial coding in grounded theory. Categories of nodes were then configured to produce concepts corresponding to selective codes in grounded theory. Following this process, different factors in both PDS and VDS were compared based on their benefits and limitations. They were analysed again to clarify advantages and disadvantages informing the development and evaluation for a subsequent study of a blended

learning environment.

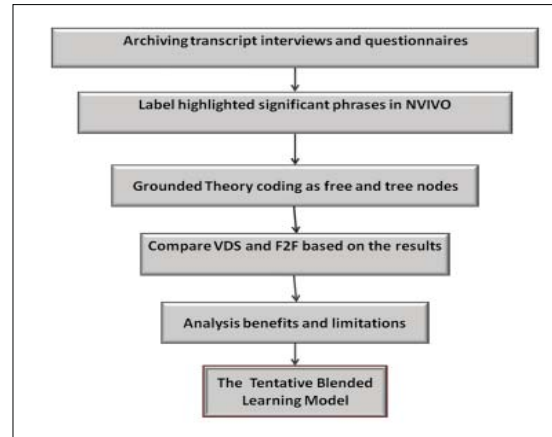


Figure 1: The process of archiving, coding, and analyzing data in six stages (Source: Authors).

Fundamental to this is a process of open, axial, and selective coding. This process involves developing various concepts and identifying links between concepts for capturing the characteristics of the central phenomena in the field of study (Strauss, 1987). Corbin states that the process of coding occurs within a consequential matrix work as a framework. This matrix enriches analysis by classifying the consequences in which setting are located and responded to (Corbin and Strauss, 2008).

#### Theoretical framework

Effective learning depends on various internal and external conditions (Kearsley and Moore, 1994) including the learning environment that can affect learning in different ways. Karakaya and Pekta (2007: 138) propose that without a

systematic method, it is impossible to organise, manage, analyse, and synthesise a study in a complex and interdisciplinary field like education; so a framework is needed to facilitate this systematic process. During the coding process, data collected from the case study were structured as tree codes which formed the core of the Theoretical framework.

Figure 2 is the final version of the initial framework offered as a basic tool for use in making decisions about the evaluation, comparison, implementation and analysis of various learning environments for design education (Saghafi, Franz, and Crowther, 2010). In the final framework, pedagogy is allocated to the central position since decisions made in this field can greatly affect the related cells. The nine represented

elements are connected linearly in two directions to form a matrix. Each three elements forming a horizontal line, indicates the elements with close relationship. The first horizontal line shows the social and physical/virtual environments for the community of learning. The second one presents a diverse 'how' for technology, learning pedagogy, and assessment. The third line describes the story of design process from input/content to output/ outcome.

### Findings

In this paper design studio education has been considered in physical terms as well as in virtual terms. Specifically it has sought to identify what needs to be considered when seeking to blend physical aspects with virtual aspects. Each section

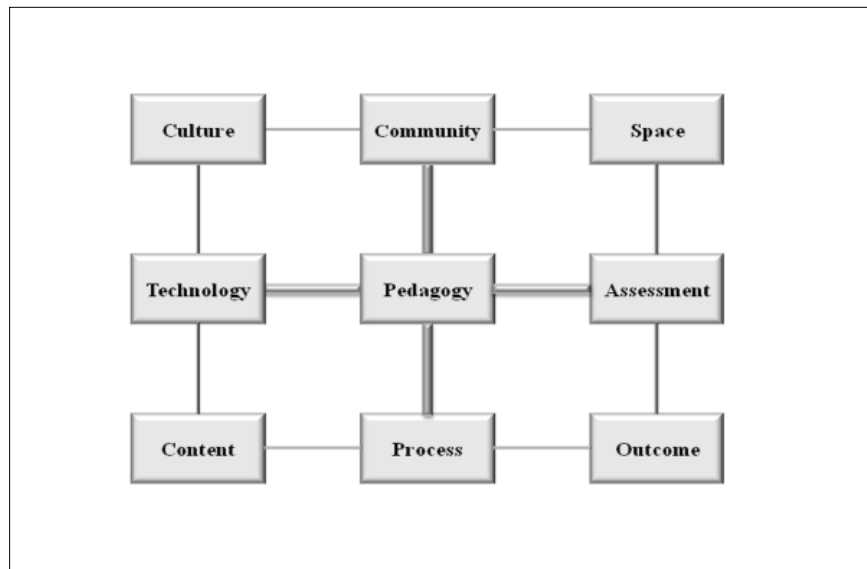


Figure 2: The final theoretical framework in design education (Source: Authors).

describes the dominant features of each element introduced in the theoretical framework:

### 1. Culture

Culture can result in different social environments; here focus on collaboration, interaction, and communication. For the participants, greater emphasis is given to the physical design studio for cultural aspects like communication and interaction, but that extent depends on other factors such as the nature of the curriculum and the teaching approaches that in some cases can inhibit communication with tutors and classmates. Even if on campus, outside work is also seen to deter students from interacting and minimising the extent to which they socialise together. There was also significance in students' preference with some preferring to work alone and others in the company of their peers.

### 2. Community

Although all people in a school form a community other sub-communities exist based on needs and preferences. Students, teachers, and administrators for example have their own communities. Forming communities is facilitated by being able to hear and see others through audio and video. In this regard PDS enables more face-to-face integration with classmates and tutors than VDS and for many students provides a more comfortable, motivating environment. In addition, a VDS can lead to alienation, confusion, and loss of identity.

For the students in the study, their sense of belonging as a student and being a part of learning community were found to be influenced by their study commitments, work activities, and private life responsibilities. As stated by one student:

[...] there is never enough time with teachers. Peers work very hard outside of uni so there is also little contact on campus. If more time was dedicated to studio and less to the culture of outside work that'd be great.

While enhancing flexibility the virtual design studio may also lead to less face-to-face contact, a situation already exacerbated by work demands experienced by students attending studio classes on campus. For many students and tutors, PDS was understood to produce more motivation to participate in the learning activities due to the face-to-face communication and interaction. As a student described; "Being in the studio room with 20 students and a tutor is really helpful, enjoyable, and motivated". For others, such an environment can be distracting and physically uncomfortable if not designed well.

### 3. Spaces

Learning space refers to the setting where the learning activities occurred, including both physical and virtual environments. To some extent, the study found that preferences for being off or on campus depended on the quality of the relationships between the students as well as the quality of the physical learning environment. It also depends on levels of comfort and the physical design studio was not necessarily perceived as being better than the virtual design studio.

A setting could be too boring, uncomfortable, or too formal to be supportive of expression and creativity. In response to a question asking 'When you are designing, how conscious are you of the world (your environment, other people, etc) in which you are physically located?', one of the students wrote; "Very, if in a boring or uncomfortable environment I cannot work".

According to an educator; an appropriate learning environment should offer a diverse range of spaces associating with diverse personalities and needs. She continues; saying that a range of lightness and darkness, private and public attitudes, and indoor to outdoor places are examples of this diversity. Flexibility is another advantage to deal with different arrangements and furniture to associate with different activities like temporary exhibitions.

Learning spaces have an important role in design studios since students build up relationship with their environment all the time. A box as a studio cannot inspire in comparison to the place that contains cultural identity, attractive physical attributes, and exhibited works which are publically displayed. Spatial aspects of design studios are also very important functionally and symbolically. Functionally, these spaces need to accommodate various modes of learning and needs of students to invite and support sustained use. Symbolically they need to read as places of exploration and creativity. These characteristics, whether existing in physical or virtual environments, can deal with different students' personalities to inform their ideas.

#### 4. Technology

The technology of education can be divided into hardware and software, such as online platforms, which facilitate the delivery of knowledge. Technology can provide noticeable benefits like access to information from different places and time. If considering design studio without using digital tools, there are many benefits that will be left, including saving time for working with resources, saving costs for publishing information, and presenting resources with more multimedia facilities and higher quality.

This research reinforces the view that the effective communication in design studio depends on simultaneous interaction to be able to respond students' needs and expectations. This process is also achievable through audio and/or video communication platforms - such as Illuminate Live - in synchronous mode (see figure 3; right side).

#### 5. Pedagogy

Pedagogy refers to the teaching style, learning approach, and curriculum; which together should be well designed to increase the effectiveness of learning environments. PDS seems to be more effective for improving skills and peer-learning while VDS is more appropriate for the activities that need to develop over time, such as research and discussion.

For one of the tutors: "I would prefer to tutor in the university environment, where you can draw and model things to explain issues to students, which you can't do easily in a virtual environment". For the students who were interviewed, tutors play an important role regarding motivation, confidence, and making the learning process more enjoyable. Students' reflections indicate that tutors' teaching styles impact greatly on students' perceptions by affecting level and quality of involvement and experience.

#### 6. Assessment

Assessment in design education occurs in various steps, including critique during the design process (formative feedback) and jury review of final presentations - summative feedback. This paper focuses on final presentations as formal assessment, comparing two modes of face-to-face and virtual. In response to the question; "what do you think is the best way to assess design projects?" a lecturer stated;



Figure 3: Left; physical design studio, QUT, 2010. Right; virtual design studio, QUT, 2010 (Source: Authors).

Exhibition style assessment in the Traditional Design Studio: where both students and staff are requested to evaluate the student work. Being able to see work in a full spread is more appropriate for comparative marking. You are able to step back or look closely at the work. There is also that real time facility that you won't perceive online.

The need for the assessment has spatial as well as technological implications. Students need ample space for mounting and displaying hard copy works and ample room for groups to view the works. In contrary, web 2 provides reviewing the design process of students' works facilitates focusing on the process rather than on the final product without need to any physical space.

### 7. Content

This element relates to what is learnt and the knowledge and resources informing the learning. Responding to a question about comparing printed and online content, many participants prefer online

materials as they are quick and easy to access. Online materials provide more facilities such as simultaneous access from anywhere, searchable texts, and detailed information. Generally, online materials provide more potential for students, but these "types of books cannot be found in online resources". This could be addressed through the provision of a "studio library". A student believes that 'weaknesses of resources and availability of materials' is the main limitation of design studio.

### 8. Process

The development of a project is achieved through several design stages and related activities which can be defined as the process. Whatever the definition of 'design process', a comparison of the activities in virtual and physical modes can lead to finding the appropriate environment for each of these stages. However, there are some activities, such as sketching, that are hard to achieve in VDS. As an educator argues, if students attend physically, in-person interaction between tutor and students is possible:



Sit at the desk now and you do some work and then show me before the end of the class. Being virtually, I can't tell them; okay, do some stuff now and show me at the end of the class. In VDS, it does not work like that.

For some students the decision to come to campus or study from home was determined by how much each world encroaches on their personal life. Some students prefer to design in the campus studio because they feel home to be too cramped. Alternatively, a studio could be helpful for some to generate an idea and obtain feedback then further develop the proposal at home.

I would like to start off with an idea in a studio, get some feedback and then play around with the idea in my own home and once I am happy with it, I would like the opportunity to discuss it more in the studio - but most of the designing I would like to do at home.

Based on the description of design process by the participants; studio can provide an appropriate space which helps students to find possible ideas and focus on their imaginations for their design projects. Since design courses involve imagination, a place plays an important role in inspiring students. In contrast when provided with contact time in class, some students come for five minutes, talk, and then disappear. For many students, most of their design conceptualization and development happens outside the studio at home.

### 9. Outcome

Outcome refers to the learning aims which are assessed with knowledge gained through the process and the end-product of learning. Design studio outcomes are dependent on various design education parameters. According to the

response of an educator in the questionnaire about factors involved in learning outcome.

Many factors, like quality of learning outcome, depend on tutors' functions. In the first case, delivering tacit knowledge even in PDS, depend on tutors' functionalities. In the second one, it affect on feeling positively.

Therefore, improving design studio elements leads to stronger outcome, while dull settings produce weaker projects. "The essence of the setting in terms of the physical design studio often seeps through the students design work - which is strength if the setting is good or problematic if it is dull". Teaching approach can strengthen the connection between theory, process of design and outcomes; and incorporating other tools such as different media to explore the design process in other ways improving learning outcomes.

### Discussion and Implications for a Blended Environment

The previous section conveys several factors which impact on design studio education. Based on participants' opinions, neither PDS nor VDS on their own can respond to all the needs and preferences of students and tutors. Each mode of delivery has special qualities and learners have different learning styles that respond to these in different ways. Therefore, a combination of several media appears to be appropriate (Moore, 2006). This would tend to suggest the need for a blended design studio (BDS) model that optimises the benefits of both modes. The development of such a model however has to be considered in the context of particular universities and the infrastructure, policy and procedures that characterise that university. In this study increasing student numbers has placed considerable

demand on studio space limiting availability and access for students.

### Comparing PDS and VDS learning aspects and perceptions

A comparative study has been made between different aspects of PDS and VDS through different surveys and interviews which present various student learning styles and preferences. The results indicate that there are some aspects in face-to-

face and web-based DS which most participants have similar perceptions of.

Table 1 represents these aspects/feelings and the related contrasting aspects/feelings to show which environment are more effective. The rating system shows a three level rating of 'totally', 'very', and 'equally' for each environment. It was shown that face-to-face (PDS) and web-based (VDS) are totally effective for the aspects of 'scheduled' and

Aspect/Feeling	Totally	Very	Equally	Very	Totally	Con.-aspect/Feeling
Scheduled	f2f				VDS	Self-managed
Inflexible on place	f2f				VDS	Flexible on place
Group approach		f2f		VDS		Individual approach
Peer learning		f2f		VDS		Independent learning
Creativity			Both			Lack of creativity
Delivering implicit knowledge	f2f				VDS	Delivering explicit knowledge
Product focused		f2f		VDS		Process focused
Instant feedback	f2f				VDS	Insightful feedback
Human-interaction	f2f				VDS	Computer mediated
Motivation		f2f		VDS		Lack of motivation
Anxiety		f2f		VDS		Security
Confidence		f2f		VDS		Diffidence
Stress			Both			Relaxation
Enjoyment		f2f		VDS		Lack of enjoyment
Sense of community	f2f				VDS	Aloneness
Clarity		f2f		VDS		Confusion

Table 1: Comparing web-based and face-to-face DS based on participants' perceptions (Source: Authors).

'self-managed', 'inflexible' and 'flexible on place', 'knowledge delivery' (implicit or explicit), 'instant' and 'insightful feedback', and 'human-centred' and 'computer mediated' interaction. There is no major difference for facilitating 'creativity' between those environments, according to most of the participants' perceptions. For other aspects, face-to-face mode acts as very effective, while web-based learning is appropriate for the contrasting side of the aspects including 'individual approach', 'independent learning', and 'process focused'. Likewise, participants' feelings have been represented about web-based and face-to-face design studios. The findings show that face-to-face mode is the effective environment for feeling a sense of 'motivation', 'confidence', 'enjoyment', 'community', and 'clarity'. Similarly, web-based learning has contributed to a sense of 'security'. Also, there is no major difference between these environments for feeling stressed or relaxed.

The results of these investigations show that there is no environment that is preferred by most of the participants for all of the aspects. The wide range of responses to the surveys emphasise students' various learning styles and preferences regarding on/off-campus participation for different aspects.

### Optimizing learning through BDS

Responding to the question 'what are the appropriate environments, time modes, and other features for design education activities?' data collected were analysed and classified with the reference to the literature.

Communication and interaction as the cultural aspects of learning environments, will improve in the blended models since these models create more opportunity for communication through

different media and modes responding to different personalities. Furthermore, BDS can lead to an appropriate learning environment in terms of developing communication and interaction through providing permanent access to physical and/or virtual design studios.

Taking the whole course online would lead to a lack of involvement in a learning community. However, students' learning experience could be enhanced by blending online within face-to-face education. Therefore, learner's motivation and confidence improves during the development of skills and other abilities (Pieta, 2009: 7). Likewise, this hybrid model, increases positive feelings because of attending in both modes, while it decreases negative feelings due to do not being limited to one mode (or perhaps the ability to make choice about where to attend). Moreover, aloneness and lack of identity are two negative feelings created in an isolated environment like home, but not in a blended one.

Some researchers like Kumar (1997: 31) state that the informal side of university life is the main feature. Informal interaction however is not offered through virtual universities. Also, physical spaces create the university spirit and campus-culture that cannot be found in virtual universities. But, it is possible to find these features in some combination of physical and virtual environments (Hashimshony and Haina, 2006: 9). To have more effective interaction however, a combination of off-campus and on-campus communication is needed (Kvan, 2001: 348-350).

The provision of permanent access to studio spaces is recognized as one of the critical issues contributing to facilities planning difficulties. Ideally it would seem beneficial to create a studio

space that has 24 hours access for the students and to encourage them to work there whenever they wanted to, thus extending their opportunity to work together and learn from each other. For design studio units, four hours per week seems insufficient especially when staff-student ratios are high. The web-based design studio can be considered as a part of this variety providing wider range for the students who are interest to communicate with different people about certain ideas or concepts through different time and space. So, a wide variety of spaces (and times) may accommodate a variety of personalities and approaches.

In terms of technology, what emerged was the need for platforms to be appropriate for the information they are delivering or the interaction they are supporting. Student satisfaction depends on providing easy navigation as well as experienced tutors who know how to use the technology. Levine and Wake (2000: 6) encourage the students to bring the virtual into the physical in order to improve design ideas and exploit its unique characters. Digital platforms can assist to deliver explicit knowledge whilst tutoring needs to be face-to-face in an ongoing constructive mode.

Pedagogically, whereas PDS is considered more convenient for communication and interaction, VDS is better suited to independent learning and improvement. In a BDS both aspects can be brought together. The tutor's teaching style and role will move from focusing on interaction in PDS to emphasising on student-centred approach in VDS alternately. Sessions which focus on improving skills and production should be achieved in PDS, while VDS should be considered for processes such as developing knowledge and research.

VDS can provide both internal and international collaboration beyond an appropriate curriculum emphasis on team-working. Internal collaboration can be enhanced through group work in the studios with the possibility of the virtual networking encouraging more effective collaboration for those feeling uncomfortable in the physical design studio. Zupancic (2007: 653) concludes that VDS derive from virtual culture, which forms new socio-spatial identity in virtual environment. Therefore, accreditation of different VDS depends on their cultural contexts.

Since both PDS and VDS assessment modes are considered as appropriate for final presentation, BDS can combine digital displaying in the physical exhibition style to capitalise on both advantages. In this case, students' works can pin up on the panels in an appropriate size, while they are presented digitally on a screen to provide for clarity and ease of communication during the presentation.

Internet-based instruction materials generally including visual information rather than audio and text, so implicit knowledge can be conveyed more effectively because of the integration of multiple senses by the variety of formats such as video and computer animation (Bender and Vredevoogd, 2006: 119). This potential can increase students' motivation and creativity. Course description and syllabi can be distributed over the Internet through online resources minimizing excessive copying or the need to place reading materials in the library. BDS can allow for design books in PDS and online resources in VDS.

In the same way, creating, developing, and reflecting during the design process can be better matched with BDS by choosing the proper

mode for the appropriate activates. BDS can divide to synchronous or asynchronous modes of communication, using face-to-face for real time interaction and web-based for reflection with time lag. In fact, real time interaction reinforces self-expression in design work, while lag time providing space for thinking about feedback. And then, considering that learning outcome is the consequence of all other factors, anything that enhances these factors will enhance the outcome; therefore BDS results in higher quality learning outputs.

## Conclusion

The initiated activity-based model – the outcome of examining the appropriate features of different activities in design education – began with comparing different aspects of design education based on participants' perceptions. Table 2 presents a blended model based on different learning activities in design studio education. Overall, many of the participants prefer a specific aspect, mode, or environment for certain activities. The first column presents eleven activities, the second shows the appropriate environment, the third is the appropriate time mode, the fourth

Activities	Environment	Time mode	Pace	Type of interaction
Orientation	f2f	Synchronous	Scheduled	Tutor-to-student
Peer learning	f2f	Synchronous	Community-paced	Student-to-student
Lecture	Both	Synchronous	Scheduled	Tutor-to-student
Communication	Both	Synchronous	Scheduled	Student-to-student
Presentation	Both	Synchronous	Scheduled	Student-to-student
Collaboration	Both	Both	Community-paced	Student-to-student
Designing	Both	Both	Community-paced	Student-to-content
Feedback	Both	Both	Community-paced	Tutor-to-student
Assessment	Both	Both	Community-paced	Tutor-to-student
Study the theme	VDS	Asynchronous	Community-paced	Student-to-content
Discussion	VDS	Asynchronous	Community-paced	Student-to-student

Table 2: Comparing design studio activities and their features: the preliminary blended model (Source: Authors).

refers to the pace of those activities, and the fifth is the main type of interaction for each activity. By reviewing each row, some aspects of each learning activities can be analyzed including appropriate environment, time mode, pace and type of the interaction.

As can be seen, VDS is the appropriate environment for studying the theme and for discussion, PDS for orientation and peer learning, and both environments for other activities. The analysis becomes more complex when considering the appropriate time mode for the same activities and their appropriate environments. For the eight activities which are achievable in both environments, five – orientation, peer learning, lecture, communication, and presentation – should be done in real time, while collaboration, designing, feedback, and assessment can be done in both time modes. However, studying the theme and discussion generally occur in asynchronous mode.

The pace of synchronous activities is scheduled and other learning activities, such as asynchronous community-based activities, benefit from being mainly community-paced. The last column shows the dominant type of interaction in the activities. It has been recognised that designing and study of the theme are mainly based on student-to-content interaction; orientation, lectures, feedback, and assessment are mainly based on tutor-to-students interaction; and other activities benefit from student-to-student as their main mode of interaction.

With this model, some sessions (including orientation in the first week) should occur in PDS to stimulate the development of a sense of community, while some other aspects should be considered for VDS, optimising both off-campus

attendance and on-campus attendance. For instance, lecturing is a synchronous activity which can be achieved in both face-to-face and live online modes to provide access from anywhere. Contrary, discussion should be achieved in web-based mode (VDS), asynchronous, community-paced and student-to-student interaction to maximise the effectiveness of learning.

In addition to providing possible combinations of the features for defining a particular application, this initial model can be used for analysing the characteristics of each learning activity in design education. Authors' recent paper (2012) presents the final model of this study.

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# THE ROLE OF THE DESIGN STUDIO IN SHAPING AN ARCHITECTURAL EDUCATION FOR SUSTAINABLE DEVELOPMENT: THE CASE OF BEIRUT ARAB UNIVERSITY

**Khalid S. Al-Hagla**

## Abstract

The level of interest in integrating understanding of sustainability into higher education is steadily growing. This paper investigates the principles of embedding this understanding in architectural pedagogy. It focuses on the role of the design studio as the heart of the architectural education process. It develops an approach that integrates both macro and micro-scale analysis to investigate the transdisciplinary and interdisciplinary aspects in architectural education. A questionnaire survey was carried out within the Faculty of Architectural Engineering at Beirut Arab University to assess the performance of five related elements: the education location, the curriculum, the external and internal characteristics of the design studio, and, finally, the evaluation process. The findings show lacking of synchronization between different interlocking disciplines and majors at university level. In addition, a clear individualism and a traditional studio culture are witnessed as main obstacles towards achieving cumulative experiences needed for sustainability understandings. Finally, the paper uses these findings to assure the need for a more comprehensive approach that draw the relation between macro- and micro-scale interventions to guarantee a better performance of the transdisciplinary and interdisciplinary aspects in architectural education.

## Keywords

Architectural Education; Design Studio; Sustainable Development; Interdisciplinary; Transdisciplinary

## Introduction

The momentum behind integrating knowledge about sustainability into higher education has been steadily increasing since the Stockholm Declaration of 1972 (Alshuwaikhat, and Abubakar, 2008:1777). Embedding these understandings has caused insightful shifts in educational paradigms. One aspect of these shifts is the movement of the focus from content and predetermined learning outcomes towards the nature of the learning experience. This vision is concerned with the kind of experience that is necessary if we are to care for personal or social transformation towards sustainability through learning (Sterling, 2004:52). Another important aspect is the move towards 'transdisciplinary knowledge' as the most suitable framework for conducting the complex and complicated practical realization of sustainability dimensions. Blewitt (2004) argues for the increasing role of knowledge that extends beyond the rules and perspectives of single subject discipline.

Gibbons et al. (1994) identify four features of this 'transdisciplinary knowledge': it develops a distinct but evolving framework to guide problem-solving efforts; the solutions involve movements in many directions, theoretical and empirical work, the diffusion and dissemination of new knowledge to participants that take place through rather than after this process; and finally, it is dynamic and constantly evolving. These features draw both the outlines required to embed the understanding of sustainability in education and the criteria used to set the problem in higher education at a number of universities (Blewitt, 2004:2).

Embedding sustainability in architectural pedagogy has brought a new paradigm of thinking about the manner in which architects, urban designers, and planners approach the design of built environments (Salama, 2002:51). This paradigm has to be seen within a wider understanding of the transdisciplinary thinking as a shifting attitude about the education for sustainable development. However, the challenge stands as how to integrate these shifting paradigms into architectural pedagogy.



Figure 1: Macro and micro scale of the study. (Source: Author).

This paper investigates the role of the design studio - as a major component of architectural education (Beamish, 2002:133) - in embedding the understanding of sustainability in architectural education. Its existence as the main forum of creative exploration, interaction, and assimilation in architectural education (Salama, 1995:1) formulates its potential role as a parameter for measuring the sustainability outcomes in the whole process of architectural education. This paper builds upon this understanding to analyze the role of the design studio for the Faculty of Architectural Engineering at Beirut Arab University. It investigates this role through the study of two different but compatible scales (see figure 1). The macro scale study addresses the principles of embedding (ESD) in higher education in general. These principles draw the broad outlines that the architectural education has to fit within to achieve the needed transdisciplinary and interdisciplinary understanding. The micro-scale study draws the link between the ESD in architectural education and the design studio as the core place of this type of education-related activity. Finally, this paper identifies five aspects related to this activity: place, curriculum, external aspects, internal aspects, and evaluation as an area of its micro-scale detailed study.

## Research Methodology

This study design encompasses a three-stage approach to investigate the role of various variables that work as inputs in manipulating the education for sustainable development in architectural education in general and at the design studio in particular. A critical review of the literature provides a framework for examining

the issue under study, pilot study questionnaire, and the final developed questionnaire. In addition, the study incorporates two methods of data collection: document analysis and a questionnaire survey, which were designed to generate both statistical quantitative and qualitative data, this would yield explanations concerning the opportunities for and barriers to embedding ESD in the design studio. Specific respondents' comments were selected from the questionnaire sheets, which either illustrated a generally representative view or offered particularly interesting explanations (Jones et al., 2008:343).

### Questionnaire

The questionnaire was designed to identify how educators perceive education for sustainable development as incorporated into studio-based architectural design education. The questions are focused mainly on the curriculum, the external and internal aspects, and the evaluation process. Questions were based on literature in the areas of ESD, architectural education, validation and accreditation, survey methods, and a pre-test survey. The questionnaire included only closed-ended questions with a comment area at the end (Milburn and Brown, 2003: 47-48). A rating system was developed based on a Likert-scale from 1 to 5, in which 5 is excellent. The sample included male and female students and encompassed the last three levels in the architectural design studio (third, fourth, and fifth level students) The responses were analyzed using a framework approach (Ritchie & Spencer, 1994), which involved a process of systematically coding and grouping data to provide a coherent thematic framework (Jones et al., 2008:344) to group comments reflecting similar attitudes.

### Education for sustainable development (ESD) in higher education

The most, as widely acknowledged by literature, accepted rationale for incorporating sustainable development in education is given in Agenda 21 at the UN Conference on Environment and Development - UNCED (Earth Summit, 1992) (Warren, 2004:104). This 40-chapter agreement, in its 36th chapter addresses that "Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. Despite, basic education provides the underpinning of any environmental and development education, the latter needs to be incorporated as an essential part of learning" (cited in Blewitt, 2002, p3). After about a decade of this agreement, the UN declared 2005 till 2014 as a Decade of Education for Sustainable Development.

Among the three sustainability dimensions (environmental, social, and economic), it is often the environmental angle that comes to the fore in ESD (Brunton, 2006:38). 'Greening the university' or 'greening the curriculum' have become commonly used phrases that tend to refer to the integration of environmental perspectives into university operations and teaching (Alabaster and Blair 1996). This is rooted in the analogy between the developments of environmental and ecological education and the understanding of sustainability. While the field of ecology shifted from a problem-solving focus to a systems approach stressing connectivity and relationships between organisms and communities (Capra, 1996), the epistemology of sustainable development literacy builds upon this shift with the addition of an emphasis on the interrelationship between

human and natural systems (Gough, 2002). Norgaard (1994) expanded this perspective by describing human and natural systems as co-evolutionary (Dale and Newman, 2005: 356). However, the comprehensive understanding of sustainable development literacy should go through all of its three spheres; the economic, the ecological, and the social. (Dale and Newman, 2005 and Brunton, 2006) Recently, a number of organizations such as University Leaders for a Sustainable Future [ULSF] (1999) and HEFCE (Higher Education Funding Council for England) have worked to emphasize the three-pronged approach of environmental, social and economic development (Brunton, 2006: 38). ULSF addresses this understanding in its vision: “‘Sustainability’ implies that the critical activities of a higher education institution are - at a minimum - ecologically sounded, socially just and economically viable, and that they will continue to be so for future generations. A truly sustainable college or university would emphasize these concepts in its curriculum and research, preparing students to contribute as working citizens to an environmentally sound and socially just society” (ULSF 2005).

Embedding sustainability in higher education implies a shift in a paradigm that highlights the values of both interdisciplinary and transdisciplinary understandings. Dale and Newman (2005: 357) assure the importance of acquiring knowledge of “interdisciplinary and transdisciplinary research methods. They include both natural and social science methodology; multiple perspective taking and making; contextual appreciation and analysis, on multiple scales of interaction; and multiple complex systems perspectives that encompasses both the parts and the whole in dynamic interactions.” They classify the required skills into facts based and process-based skills (see table 1). In this regard, adaptability stands as the key to the utilization of the above skills. The basic requirement of sustainable development literacy is ‘adaptive flexibility’, which means “the ability to address changing conditions through a process of continuous adaptive learning and the possibility to initiate new development trajectories” (Rammel, 2003: 397). In addition, Sustainable development education encourages learners to develop problem definitions from several perspectives,

<b>Facts-based skills</b>	<b>Processed-based skills</b>
Systems theory	Systems thinking
Related disciplinary based knowledge pertaining to the ecological, social and economic imperatives	Interdisciplinary and transdisciplinary research methods
Natural and social science research methodologies	Perspectives taking and perspectives making
Action research	Contextual appreciation and analysis
Governance	Barriers analysis
	Backcasting and scenario building
	Multi-stakeholder processes
	Values articulation

Table 1: Sustainable development literacy skills (Source: Dale and Newman, 2005:357).

and most critically, from interdisciplinary and transdisciplinary critiques and perspectives (Dale and Newman, 2005: 357). Moreover, Rassool (1999) assures the importance of 'multi-literacy' as a concept that introduces the idea that our civil societies have to become knowledgeable and literate of the general approaches to interdisciplinary problems.

Sterling (2004) highlights the most important features of the sustainable education paradigm as "implies embedding, embodying and exploring the nature of sustainability as intrinsic to the learning process. This is education 'as' sustainability – nurturing critical, systemic and reflective thinking; creativity; self-organization; and adaptive management - rather than education 'about' sustainability, or education 'for' particular sustainable development outcomes."

### Education for sustainable development (ESD) in architectural education

As many other disciplines, the movement from modernism to post-modernism has profoundly affected the approach to architectural design. While the modernist movement has encouraged the perception of the designer as supreme creator, making decisions based primarily on aesthetic, financial, theoretical, and political concerns, the move to post-modernism has placed a greater emphasis on issues, such as social responsibility, sustainability, environmental responsiveness, environmental integrity and human health (Milburn and Brown, 2003: 47). Salingaros and Masdenm (2008) call for a new paradigm that reveals a greater concern to structural principles found in the physical universe, supplemented with a deep understanding of the human psyche: of human

needs, activities, and perceptive mechanisms. This shift is clearly reflected in architectural education. Salama (2008) depicts it as a shift from 'Mechanistic' to 'Systemic' pedagogy, where the latter works for a more integrated vision for education as part of a process much of which takes place within society. He highlights three knowledge content areas emerging to reflect continuous shifts in knowledge content. These are: environment behavior studies - EBS, sustainability and environmental consciousness, and digital technologies or virtual practices (Salama, 2007). Regarding sustainability, he argues for the challenge of embedding knowledge content that works for the practice of interdisciplinary and transdisciplinary and to develop lifelong learning skills in architectural design education.

This changing attitude towards architectural design highlighted teaching sustainable design to architects as a fundamental base for their study (Fleming, 2002: 146). However, the challenge is to put this need in such an operational way. Esmail Baniassad (2001), Chair of Architecture at Chinese University of Hong Kong emphasizes this point as he says "The challenge of sustainable design education lies not in our recognition of the need for a change in our values. It lies in how to take it beyond a mere change in our verbal vocabularies. The challenge is to go beyond intentional to operational.

As a response to these challenges many architectural programs have struggled to find solutions which lie a common goal of establishing opportunities within the design studio pedagogy to incorporate collaborative and interdisciplinary teaching and learning as

a key factor in achieving future sustainability (Fleming, 2002: 147). The argument lies beyond this assumption is that designing for sustainability is a more complex process that requires a horizontal multidisciplinary interventions from the outset of a given project (Fleming, 2002: 147). Douvrou (2006) suggests a problem-based learning as an approach in the teaching of sustainable design. Boyer and Mitgagng (1996) asserts this vision; "Sustainable architecture suggests a curriculum built around collaboration and team work, not only with other architects but with other disciplines". Accordingly, achieving a high level of sustainable design comes through teaching the students how to work together and across disciplines. One good example of developing strategies to integrate sustainability into curriculum is in the 'Educating Architects for Sustainable Future' - EASE from Ball State University. These strategies include "developing a fabric of many voices in studio instruction ... replacing the architect as hero model with architect as team player; and promoting an interdisciplinary/collaborative approach among designers, sociologists, ecologists, etc" (Boyer and Mitang, 1996). The need for this multimodal character is insured in the practical world. The NAAB (the sole agency authorized to provide national accreditation to professional degree programs in architecture in the USA), states programs are "to produce graduates who: . . . are able to solve architectural design problems, including the integration of technical systems, health and safety requirements. They comprehend architects' roles and responsibilities in society" (NAAB, 1998). The process of accreditation requires that students of the program possess skills and knowledge defined by a set of performance criteria (NAAB, 1998).

Attaining the needed collaborative and interdisciplinary teaching and learning as a key factor in achieving future sustainability raise the question about how to integrate sustainability into the fabric of the architecture curriculum. Wright (2003) classifies three different approaches to introducing sustainable design into the curriculum regarding its degree of intervention. All of these approaches include the assumption that sustainability already permeates the curriculum by its nature, expansion of the existing courses concerning environmental systems, and the revision of the entire curriculum to fully integrate the subject (Wright, 2003: 102). The first approach is based on the belief that sustainable design is so fundamental that it is simply a part of all we do in architecture and therefore must permeate the entire curriculum by its very nature. "Furthermore, all courses simply begin with the assumption that the affinity of architecture with the natural processes is historically based, theoretically critical and a technically inventive way to (re) inform design" (Wheelwright, 2000). However, this approach assumes the sustainability understandings are rooted in all aspects of different courses. Wright addresses this approach as "it supports the premise that sustainable design is so fundamental to architecture that it should not be necessary to address the subject outside of the normal theory and practice" (Wright, 2003: 102). However, this approach seems to be too idealistic as it assumes that the faculty will act on their own accord and introduce sustainability into all aspects of their area of teaching emphasis, which is actually not achieved. The second approach builds upon the already existing courses related to environmental control systems - ECS. It utilizes the technical knowledge - normally presented

in these courses - to develop an understanding of the building elements, which pertain to the modification of the microclimate for purposes of human use and comfort (NCARB, 2000). This approach makes minor intervention to the curriculum as the overall curriculum remains largely unchanged and the importance of the ECS subjects and environmental topics in related courses are increased. In addition the curriculum has to be adapted to contain more in depth courses in environmental controls (Fraker, 2000).

While having an advantage that the faculty who has an understanding of the technical aspects of the subject material is central to the introduction of sustainability into other areas of the program, this approach is criticized for a number of defects. The first is the shrinkage in the importance of a number of courses including the design studio compared with the growing importance of ECS subjects. The second is narrowing the responsibility of conducting the sustainability understandings to a very few faculty that may not be in a position to fully integrate the subject into the design studio 'they are not the individuals guiding the design theory in the program' (Wright, 2003) put a limitation to this approach. However, this approach needs to highlight the technical aspects of sustainable design with the possibility of understating the need to place the issues in a larger context within the program (Wright, 2003: 102). The third approach draws a wide range of integrating the sustainable design understandings into all the course work and states it in the curriculum, which needs drastic changes to curriculum to be reviewed and revised to introduce sustainability. One good example of such comprehensive approach is

the center for Regenerative Studies at Cal Poly Pomona where it offers a physical community where students from different majors live, study, and work together in a permaculture setting (Fleming, 2002: 147). This approach is characterized by including the entire faculty in the subject of sustainability and ensures the integration of the subject into all the course work, including the design studio (Wright, 2003: 103). The difficulties of this approach are that it needs a commitment of the entire faculty to the exploration of the subject and requires a complete revision of the curriculum, which is practically not easy to achieve.

The actual challenge at the pedagogical level is how to develop design projects to promote an interdisciplinary setting regarding the traditional cultural misunderstandings and sometimes confrontations. This needs a comprehensive organization and commitments at different levels (Fleming, 2002: 152). Esmail Baniassad (2001) asserts that, the challenge is deep and that the change it necessitates will be fundamental. It is not going to be met by the addition of information on top of existing programs of architecture, nor will it be met by general statements of intention. Among these operational challenges, a number of obstacles stand against achieving more advances. On the one hand, many architectural faculties do not care enough about the issues or cannot find ways to integrate a new pedagogical focus into the traditional design studio settings (Fleming, 2002: 146). On the other hand, shallow interventions in the already existing curricula by adding more information to already overburdened studio pedagogy bring about another obstacle. One more important obstacle is the long-established thoughts of



studio professors about the dominance of a building's form and aesthetics over the more technically demanding and postmodern goal of designing a sustainable building.

### Design Studio and Education for Sustainable Development: Beirut Arab University (BAU) as a Case Study

The undergraduate program offered by the Faculty of Architectural Engineering was launched in 1962 as the fourth faculty at Beirut Arab University (BAU). This was one of the early programs in architectural education in Lebanon. Since its launch, the program has been revised on several occasions to accommodate feedback from students, industry and, lately, from the accrediting bodies (especially the RIBA). The program was upgraded from the extended academic year system to a two-term scheme in 1993. More recently, in 2005, the faculty implemented the Credit Hour system, which spreads over a 10-semester period (minimum). The faculty in its mission highlights the main features of its education perspective, which were consequently reflected in its curriculum. The main aspects could be seen as focusing on the core areas of the profession, providing the proper educational atmosphere, embedding the sense of responsibility towards society, culture and the environment, and, finally, advancing architectural knowledge.

The program encompasses a total of 180 credit hours, 36 credits in each of the five study areas. These credits are taken as follows:

- 132 Credit of mandatory courses, consisting of the fundamental structure of the program, which include Design Studios, Execution Design, the essential theoretical and technical

requirements, and courses in Civil Engineering.

- 32 Credit of faculty elective courses, divided into two levels; 16 Credit in the preliminary & intermediate levels, and 16 Credit in the advanced level (with a total percentage of 17.8% of total taken credits).

- 16 Credit as general university requirements divided into 5 Credit Mandatory university courses and 11 Credit in elective university courses (with a total percentage of 8.9% of total taken credits).

The design studio takes up 10 Credit at each level (from the first to the fourth) and 15 Credit at the fifth level (of these credits, 10 Credit are for the graduation project), representing the largest share among all the studied courses (about 30.6%). The subjects related to the engineering program (Civil and Mechanical Engineering) take up 12 Credit, studied along the five levels of the program, with a percentage of about 6.7%. The program in its elective division imparts a number of courses that provide a basis for an understanding of sustainable development. However, the role that these courses play varies widely according to their type and the level at which they are taken. These courses are distributed along three levels: preliminary, intermediate, and advanced. The preliminary level contains Environmental Studies, Environmental Sustainability in Architecture, and Social Studies in Architecture, the intermediate level contains Architectural Landscape and Urban Landscape, and the advanced level contains Vernacular Architecture, Design and Building Economics, Building Reuse, Conservation of Historic Buildings, and Environmental Assessment.

### Design Studio

The study in the Faculty of Architectural Engineering at BAU depends mainly on

the design studio as the backbone for the architectural education. The weight and time it takes reflects its importance. However, it takes up about 27.8% (5/18) of the total credit hours studied each term and about 35.7% (10/28) of all teaching hours. The importance the design studio has is consistent along the five levels of the study - two modules in each level, and succeeding in each of these levels is a prerequisite to move to the higher one. This guarantees attaining the needed cumulative knowledge while upgrading through these levels. The first level - in both of its two modules, the first and second term - is directed towards the study of the architectural design fundamentals. Starting from the second level, the studio-based design education places an emphasis on analysis, research and experimentation as an important part of the design process, which pave the way to coming to a proper design. At this level, the design studio represents a basis for the understanding of architectural design as a response to the increasing complexity of ethical, social, conceptual and formal conditions, such as sustainability, identity, cultural imperatives, and modes of realizing architectural designs. Students are asked to make designs in response to specific aims including modular design, architectural space grouping, articulation of space and functional relationships. In the second module of this level, the design studio draws a number of constraints as a problem-based study approach regarding the building and site relationship, environmental aspects and site planning. The third level builds upon the previous two levels. The students are asked to develop design projects based on the disciplinary or interdisciplinary theme of the design studio. Detailed knowledge of a specialist or interdisciplinary aspect of

design is required, as are its oral and graphic presentation and demonstration. In addition, a set of aims are to be fulfilled regarding the process of site analysis, space organization (interior and exterior), structural systems, forms, the advanced study of building context, the development and creation of architectural character and identity in the design of spaces and buildings. The fourth level comprises the study of more complicated patterns of space, form, functional relationships, and circulation. In its second module, the design studio-based study draws a more comprehensive approach, as it links all the physical, social and economic aspects of more complicated projects. In addition, land use, circulation, densities, and structural systems are deeply studied. The fifth level emphasizes design studio topics requiring theoretically informed and viable architectural solutions. The studio work is coupled with extensive analysis, research and experimentation. In addition, it focuses on giving general training to handle large architectural problems with special emphasis on all the professional and technical problems through research work, the formulation of concepts, and design processes. The graduation project represents the second module of this level. It encompasses a comprehensive design project that shows the formulation of all the previously studied skills.

The previously addressed studio-based levels for design education show that embedding sustainability understandings, concepts, applications, and methods is not placed at the heart of the curriculum's objectives. However, the importance given to some related concepts along the five levels draws the main contributors to promote sustainability foundations during the study. In addition, the

flexibility of the curriculum and the wide range of its interpretation perspective enable the professors and instructors to have an important impact on the education process within the studio.

## Questionnaire Results and Discussion

### Questionnaire design

A questionnaire survey was designed and issued at the beginning of the semester to all students enrolled in the design studios at the third, fourth, and fifth levels. Students were asked to complete the questionnaire during the design studio, which helped to ensure a good response. There was no participation of studio professors or teaching assistances while completing the questionnaire to eradicate their impacts. A sample of 103 students (31 in the third level, 43 in the fourth level, and 29 in the fifth level) out of 177 students completed the questionnaire.

The questionnaire design contained five main related aspects to investigate the role of design studio in conducting concepts and understanding concerning the sustainability. These aspects include the place, the curriculum, the external aspects (outside the studio), the internal aspects (inside the studio) and the evaluation process. In addition, the students were asked to rank different sustainability dimensions - environmental, social, and economic - regarding three criteria (the design proposal, the guidance presented at the studio, and the previously studied courses). However, the comments given at the end part of the questionnaire (48 out of 104 respondents) show the interest of respondents in integrating sustainability aspects in architectural education and its related aspects.

The five aspects selected for investigating the role of design studio in embedding ESD in architectural pedagogy were concluded mainly from the literature review. The place of the study comes as the first of these aspects. It asks about the impact of the surrounding environment on the attainment of sustainability practices and concepts. However, it identifies different levels of enclosure for the study; the site, the building, and the studio. The second aspect is the curriculum. In this regard, the respondents are asked to rate the impact of studying mandatory architecture and engineering courses and the elective courses of both the faculty and the university. The last question in this part tries to link the cumulative knowledge of sustainability developed along the hierarchical levels of design studios. It asks respondents to rate the contribution of the previously enrolled design studios in attaining an understanding of sustainability. The third part asks about the impact of the external but related aspects of the design studio. It investigates the role of students' own research about different sustainability concepts, its aspects, the site visit and the impacts of both physical and social contexts. The fourth part - as the core of this research - asks about different characteristics inside the studio. It asks the respondents to rate the role of the following items: the theoretical lectures (about aspects of sustainability and the resulting understanding) given at the studio, the instruction given by both the teaching staff and teaching assistances, the teaching techniques used in the design studio, the discussions within the studio with respondent's colleagues and the collaborative (oral) discussion of design proposals. This part also asks two rating questions about modeling (either mathematical or computer-based) to evaluate

the design proposal regarding its sustainability aspects, and the other one concerns discussing design proposal with specialists regarding any of the aspects of sustainability. Finally, the last part asks about evaluation as a final part of the educational process.

## Results and Discussion

This part of the study follows a methodology that correlates the numerical findings of the questionnaire to the respondents' comments. It interprets the questionnaire findings horizontally and vertically, as it links between the three levels of the study in addition to comparing different aspects at the same level. However, the general reading of the questionnaire's findings shows the high score of the fourth level respondents towards almost all of the asked questions compared with those of the third and fifth levels; this reflects the importance given to promoting the understanding of sustainability in the design studio. Another important note is that

the respondents were interested in answering the questionnaire, and their feedback shows a positive attitude towards the educational process. One respondent in the third level comments that "...I encourage such researches and questionnaires in order to have scientific records of the critical problems according to sustainability relative to architecture."

### Sustainability dimensions

The findings of the questionnaire show the unbalanced importance given to different sustainability dimensions. The environmental dimension scores the highest compared with both social (the second) and economic (the third). This is consistent through all study levels and all architectural studio-related elements - the previously studied courses, the guidance presented at the studio, and the design proposal (see table 2). The respondents' comments cover these areas and point to evaluation as another important aspect. The comments come to show the need for more

To what extents do the following items give importance to ?	3 <sup>rd</sup> Level	4 <sup>th</sup> Level	5 <sup>th</sup> Level	AV
<b>Your design proposal</b>				
Environmental sustainability	3.84	4.23	4.21	4.09
Social sustainability	3.55	3.70	3.34	3.53
Economic sustainability	2.58	3.16	2.83	2.86
<b>The guidance presented in design studio (by teaching staff and assistants)</b>				
Environmental sustainability	3.71	4.28	3.03	3.67
Social sustainability	2.87	2.72	2.72	2.77
Economic sustainability	2.71	2.81	2.69	2.74
<b>The previous studied courses</b>				
Environmental sustainability	3.68	3.79	3.55	3.67
Social sustainability	2.81	2.49	2.83	2.71
Economic sustainability	2.84	2.98	2.62	2.81

Table 2: Findings of the questionnaire regarding sustainability dimensions. (Source: Author).

To what extent do the following items affect your sustainability understandings?		3 <sup>rd</sup> Level	4 <sup>th</sup> Level	5 <sup>th</sup> Level	AV
<b>1. Place</b>					
1.1	The layout of BAU Campus in Debbieh and its natural features	3.35	3.44	3.34	3.38
1.2	The building of the Faculty of Architectural Engineering	3.10	3.44	3.14	3.23
1.3	The Studio Layout	3.00	3.09	2.72	2.94
<b>2. Curriculum</b>					
2.1	The previous studied mandatory courses (Architectural courses)	3.45	2.81	3.59	3.28
2.2	The previous studied mandatory courses (Engineering courses)	1.87	1.95	2.10	1.98
2.3	The previous studied faculty elective courses	3.00	2.67	3.21	2.96
2.4	The previous studied university elective courses	1.55	1.98	1.72	1.75
2.5	The previous studied programs of architectural design (in previous levels)				
2.5.1.	Second Level	2.90	2.51	2.17	
2.5.2.	Third Level		2.72	2.86	
2.5.3.	Fourth Level			4.34	
<b>3. External Aspects (outside the studio)</b>					
3.1	Your own search about sustainability and its related aspects	3.19	4.05	3.97	3.74
3.2	The site visit (project location)	2.94	3.14	3.10	3.06
3.3	The physical context of the project	3.29	3.28	3.28	3.28
3.4	The social context of the project	2.71	3.09	2.72	2.84
<b>4. Internal Aspects (inside the studio)</b>					
4.1.	The theoretical lectures (about sustainability aspects and understandings)	3.10	4.44	3.59	3.71
4.2.	Guidance presented by teaching staff	3.19	3.88	2.69	3.26
4.3.	Guidance presented by teaching assistances	3.16	3.35	2.66	3.06
4.4.	Teaching technique in the design studio	2.71	3.16	2.41	2.76
4.5.	Discussion with your colleagues	2.74	3.44	3.21	3.13
4.6.	Collaborative (oral) discussion about design proposals	3.10	3.23	2.66	2.99
4.7.	Were you encouraged to use any model (mathematical, computer, etc.) to evaluate your design proposal regarding sustainability aspects?	2.58	2.77	2.97	2.77
4.8.	Discussing your design proposal with any specialist regarding any of sustainability aspects	2.23	2.77	2.93	2.64
<b>5. Evaluation</b>					
5.1.	The evaluation of your design proposal in its different preparation stages	2.58	3.56	2.66	2.93
5.2.	The evaluation of your final design proposal	2.87	3.42	2.72	3.00
5.3.	The jury discussion and evaluation of your final design proposal	2.35	2.72	2.24	2.44
Do you think that the previously mentioned sustainability aspects and indicators were taken in consideration during evaluation process?		2.55	3.33	2.62	2.83

Table 3: Questionnaire findings regarding different aspects that shape the role of the design studio in embedding the understanding of sustainability in the architectural education process. (Source: Author).

guidance regarding social and economic dimensions "The design studio makes emphasis on environmental sustainability and forgets all about the social and economic aspects. More guidance in studio according to social, economical, and environmental sustainability must be taken in consideration". The previously studied courses (mandatory and electives) do not help students to build a comprehensive understanding of the integrated typology of the different sustainability dimensions. The respondents' comments come to ensure this fact "I think we should have more courses about sustainability not only environmental one but give some importance for social and economic, we should study about the three parts of sustainability equally to produce a better project. Instead of Human Rights, Arabic, and English -university mandatory courses, Sustainability courses (Social, Environmental, and Economical) should be given". Additionally, the comments show evaluation as an added element that should place a greater focus on the environmental sustainability dimension and the evaluation make more emphasize on environmental sustainability, than social sustainability, and hardly any emphasize on economic sustainability aspects.

### Design Studio

Table 3 shows the questionnaire findings and the score of each of the five mentioned aspects and their subdivisions. The first of these aspects is the place. The results show the positive impacts of the place of the study on attaining sustainability understandings. The natural features of BAU's new campus at Debbieh scored the highest compared with the Faculty building (the second) and the studio layout (the third). While there is a consensus between

the respondents of the three levels on the vital role that the natural features of the site play (as indicated by the high rating score), there are differences in their perspectives towards the layout of the studio. This could be seen as the result of different studio layouts and the potential of each layout to facilitate communication and interaction within the design studio.

In spite of being one of the most important aspects, as indicated in respondents' comments, in attaining an understanding of sustainability, the 'Curriculum' and its related sub-items show the lowest scores compared with other items. The detailed results, while showing a relative appreciation for the previously studied Architectural mandatory courses, show both the previously studied mandatory engineering courses and the university's elective courses as having very minor impacts. This reflects a major deficiency in creating transdisciplinary and interdisciplinary channels as mandatory features to attaining a deep understanding of sustainability.

A respondent commented, "...I think there should be elective & mandatory courses that would guide students towards better sustainable designs..." However, the fifth level respondents show higher scores compared with both fourth and third level respondents when it comes to ensuring the impacts of the greater emphasis made at the fourth level to the understanding of sustainability. The results show a gap in the cumulative understanding of sustainability between different consecutive levels. Respondents noted that "...the study in the previous years doesn't give good sustainability background.... We need more organized system, in order to pass from level to another". While the results scored in table 3

show a consecutive increase in the cumulative understanding of sustainability between different consecutive levels (from the second to the fourth level), the comments come to show a gap in this cumulative experience between the fourth and fifth level. A respondent noted that "in fifth level there is no importance for sustainability, the most important is only for architectural drawings while during fourth level the most analyzed sustainable studies were developed". In addition, the respondents' scores and comments show a lack of a comprehensive vision for embedding sustainability understandings in architectural education distributed along different levels of the study. Respondents commented, "There must be more progress and new ideas and methods to incorporate sustainability within our design studio moving from one level to another.... We want from the faculty to begin the sustainable studies from the second level and to give a big part of the grade to the sustainable in the final evaluation and jury".

The questionnaire's findings show the important role that the external aspects (outside the studio design) play in attaining sustainability understandings. The respondents rank their own research work -as a part of the design process- the highest among all other external aspects. One respondent noted that "the doctor talks about sustainability but it is not enough in my research I find more things that need elaboration". This growing interest in embedding research work into the design studio is faced by two obstacles, as mentioned by the respondents: teaching techniques and evaluation criteria. Respondents noted that "...the staff is not giving the student chance in making any research or opinion about sustainable architecture (I think this is a major

problem why we are not up to date).... Efforts done on research for sustainability aspects are not appreciated in evaluation". Among other external aspects are the awareness and analysis of the social context of the projects. This item scores the lowest among all of external aspects, which is consistent with the low importance given to the social dimension of the understanding of sustainability compared with the environmental one, as indicated in table 3.

The internal aspects come to the heart of the role that the design studio plays in engendering an understanding of sustainability. Table 3 shows a high score of the fourth level regarding different items compared with the other two levels (third and fifth), which are consistent with the previously discussed items. Among all the internal aspects, the theoretical lectures (about sustainability aspects and understandings) given within the design studio are the most important driver of attaining an understanding of sustainability. In addition, the collaborative (oral) discussion within the design studio and with the colleagues has a considerable contribute on. The two aspects that reflect a more scientific approach to dealing with the understanding of sustainability (modeling and consulting expertise) score the lowest among all the aspects, which reflect a more traditional problem-based approach to deal with the design studio. One important aspect to be considered is the impact of teaching techniques used in the design studio on attaining an understanding of sustainability concepts. This is apparent while comparing the score of this item between the third, fourth, and fifth levels (see table 3). The respondents' comments shed light on more detailed aspects. They address a number of in-studio obstacles that negatively

affect attaining extensive understanding for sustainability. The first of these obstacles is the theoretical typology of the concept that needs a lot of elaboration to be physically embedded in design projects. Respondents note that "...there is a Lack of visual application for the theoretical ideas studied within lecture halls.... The courses we study about sustainability aren't enough and their being theoretical without real testing and ways of using sustainable architecture in studio. They always talk to us about sustainability but they don't show us some good examples that can help us" "We have reached a good understanding for sustainability techniques but not for sustainability design". The last comment shows the need for more in-depth guidance that goes beyond the cliché embedding of sustainability techniques in the design process. Another important obstacle is apparent from reading the respondents' comments regarding the type of guidance they get in the design studio. This item, type of guidance, is correlated to a number of sub-items. The first of these is the difference between teaching staff in their evaluation and acceptance of sustainability concepts. These changing perspectives negatively affect the students' educational outcomes. They note that "here whenever you talk or use any questionable ideas in our design, the doctors under estimate it, they are divided about the importance of sustainability itself... some professors give a high importance for sustainable design and aspects while teaching assistances don't give the same importance for the sustainability issues." The second is the lack of coordination between different levels of design studios. This makes the knowledge of sustainability not rooted in the design process. In this regard, fulfilling sustainability requirements is treated as a prerequisite to move to a higher

level, which negatively affects the cumulative experience developed along the design studios.

Evaluation comes as the final step in drawing a comprehensive vision of embedding sustainability understandings in studio-based architectural education. Table 3 shows the evaluation process as one of the weakest points among the aspects of design studio. However, part of these results is due to the usual disappointment architectural students have after any evaluation process, but linking these numerical indicators to respondents' comments sheds more lights on the negligible role that evaluation plays in intensifying the understanding of sustainability. The problem could be addressed in two areas: the evaluation during the design process and the final evaluation - jury. The results (see table 3) show the high score that the fourth level respondents gave to the evaluation process compared with both the third and the fifth level respondents. In addition, all levels show a slight change in score between the regular evaluations and the final evaluation within the design studio, which reflects a consistent use of the same evaluation criteria. This is not the case when comparing the regular design studio evaluations to the jury discussion and evaluation (especially in the case of the score given by the fourth level respondents). The respondents' comments come to cover both types of evaluation. They comment that "At the beginning, of any project we are guided to use sustainability understandings and concepts, but the evaluation come completely against these ideas this leads us to work not seriously and reflects to our non serious thinking about sustainability.... I don't think that it is taken into consideration while evaluating



our work.” In addition, the respondents show their disappointment regarding the jury “The jury discussion was extremely disappointing.... I mainly used sustainable studies in my design project in fourth year. I was evaluated and discussed about it in the studio. But in jury it was not the case...the jury doesn't give importance to sustainability analysis and the importance is directed mainly to function and structural aspects.”

### Conclusion

While the design studio has the potential to manipulate a large portion of the factors that affect embedding sustainability understandings in the architectural pedagogy, its role has to be addressed within a wider scope of the education for sustainable development (ESD) in higher education. The shift towards more interdisciplinary and transdisciplinary practices in architectural education -needed as prerequisites to attain an understanding of sustainability - has to be managed within a wider context that connects different university disciplines. This comprehensive vision implies a participatory epistemology that seeks wholeness and reflects intrinsic and transformative values. This requires a shift from facts-based skills to processed-based skills. This implies a shift from individual learning dominated by theory and a focus on accumulating knowledge and familiarity with the content, to collaborative, praxis-oriented learning that links theory and experience and focuses on self-regulative learning and real orientation with issues.

This holistic vision required orchestrating different interlocking disciplines and majors at the macro level (university scale), seems to be lacking in

the Faculty of Architectural Engineering at Beirut Arab University. The questionnaire's findings show the weak contribution of courses taken from disciplines outside of the Faculty of Architectural Engineering in attaining a proper understanding of sustainability. Both the mandatory and elective university courses and the courses taken from other disciplines (mainly from the Engineering Faculty) scored the weakest as drivers of understanding. The questionnaire's findings also show the lack of coordination between different levels of study within the Faculty. This micro-scale analysis shows the individualism in design studio teaching and a more traditionally unreceptive design studio culture that negatively affects the student's cumulative experience, which has to be developed while moving from one level to a higher one.

Parallel to the initial efforts made to integrate a sustainable pedagogy through collaborative / interdisciplinary project-based learning within the Faculty of Architectural Engineering, a number of obstacles stand against these efforts. As stated in the questionnaire's findings and comments, one of the leading and most influential obstacles is the traditional vision of design studio professors regarding changing their mindsets to integrate sustainable principles into their studios. The highest share of their attention is driven toward a typical mindset involving aesthetics and poetic form at the expense of issues such as energy efficiency, air quality and green materials. This limited vision has to be expanded to incorporate these issues as inspiration for sustainable building design in addition to building aesthetic foundation, which will always remain in the domain of architects' interest. This traditional vision of design studio professors is directly reflected to projects' evaluation within

design studios and at the final juries, which has profound negative effects on students.

Finally, this paper comes to conclude that, while the Faculty of Architectural Engineering aims to incorporate an understanding of sustainability to its educational processes, the approach it follows lacks the needed wholeness - that could be the case in many similar schools of architecture. The approach used represents a minor intervention for the curriculum by increasing the importance of environmental topics in related courses, which is not enough as it is narrowing the responsibility of promoting the understanding of sustainability to very few professors, which may not be in a position to fully integrate the subject into the design studio. A wide-ranging integration of sustainable design into the entire coursework is needed. This requires the commitment of the entire faculty to the exploration of the subject and to the complete revision of the curriculum. This draws a roadmap for all schools of architecture that shift towards more integration of sustainability understandings in their architectural pedagogy.

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## A FRAMEWORK FOR INVESTIGATING URBAN QUALITIES IN EMERGING KNOWLEDGE ECONOMIES: THE CASE OF DOHA.

Florian Wiedmann, Ashraf M. Salama, and Alain Thierstein

### Abstract

Over the last decade Qatar's capital city Doha has been undergoing a new period of urbanisation that has created a new perception of the city as an emerging urban centre in the Gulf region. It has witnessed rapid urban growth driven by economic diversification strategies that have liberalised its markets. At the same time however the general urban consolidation has not kept pace and the liveability of many areas has decreased in quality despite the transformation of the city into a global hub because of large-scale projects. This paper aims to introduce a framework that can be utilized to analyse the complex interdependencies between Doha's recent economic transformation and the changing structure of its urban environment. It is designed to deliver insights into the various factors that produce urban space and their individual effects on urban qualities, taking as its basis Henri Lefebvre's triad of space production. The analyses resulting from the application of this framework have the potential to contribute to a comprehensive understanding of the needs of a thriving knowledge economy and the emerging urban environment that accommodates it.

### Keywords

Knowledge economies; spatial development; built environment; urban qualities; Doha; emerging city.

### Introduction

In recent years, , the on-going expansion of global networks has led to the emergence of new cities as contenders in the competition to establish international service hubs. Their main characteristic is the immense speed of their urban growth borne up by deregulation policies designed to attract investors (Stren, 2008, p. 57) While such rapid growth is necessary for becoming a viable market within global networks, many aspects of urban consolidation have been neglected because of extensive deregulations regarding urban developments. The resulting lack of public services and amenities has led to a gradual deterioration in urban qualities, which is reflected in traffic problems and fragmented urban structures. This in turn hinders qualified workforce from investing their lives for the long-term in such cities, causing a high employee turnover. Their investment however is essential to successfully establishing a knowledge economy, which depends to a large extent on an environment that allows companies to build on continuous human resources. Today, more serious consideration of urban development is urgently needed in the case of

such emerging cities in order to understand the complex interdependencies between economic diversification and urban qualities.

Such consideration is particularly necessary for Gulf cities such as Doha, which in recent years has adopted global strategies to diversify its economy. As a consequence, the real-estate market was liberalised and many companies together with their employees relocated to Doha, creating a huge impact on the city's population and urban structure (Adham, 2008, p. 236). Within only 10 years Doha's population has tripled from about 500,000 to over 1.5 million inhabitants to date, and while in the past Doha constituted of two main elements, namely, a mixed-use centre and residential suburbs, the complexity of its new phase of urbanism driven by many different interdependent factors is generating a more diverse urban structure. Since investors

generally prefer coastal areas, most of the recent developments have been concentrated along Doha's shoreline. The iconic 'Pearl' development has expanded the city to the north along the coast and a new CBD and city skyline has emerged in West Bay (Figure 1), connected by the Corniche – the highlight of Doha's urban structure – to the old city centre. However, beyond the architectural theatricality of the coast, urban qualities decrease further inland, creating a perception of Doha as a segregated and fragmented city.

The important factor that generates comprehensive urban qualities is the active participation of a society that demands these high standards in their surroundings (Pieterse, 2000). In the case of emerging cities such as Doha the society is still evolving, which leads to increasing responsibility on the part of planners and decision makers to understand the needs



Figure 1: Doha's evolving skyline (Source: Authors).

of the developing society regarding its space. Doha's economic diversification is dependent on a large group of qualified workforce to sustain newly established knowledge economies. Thus, it relies heavily on its urban qualities, which are an important factor in preventing its international workforce from relocating to other competing cities within the global networks and within the Gulf region itself. Doha has initially attracted these human resources due to high salaries and a generally tax-free environment but in the long term a generation of a knowledge population has to consider the city as its home for various other reasons in order to sustain the economic balance. In addition, continuity in the society will be necessary in order to develop innovation and the competence needed to become a service centre competing on a global level. While in the past and present wealth from fossil fuels has been key to sustaining immigration, future developments will depend on an emerging society who identifies Doha with a high standard of liveability.

In order to produce strategies and plans that can serve as the basis for the development of liveable cities, the current urbanisation process needs to be analysed in a way that goes beyond the usual examination of the physical environment. Thus, a framework is needed which takes into account all of the multi-layered factors that impact urban space in order to determine more accurately the urban potentials and deficits that affect the emergence of knowledge economies. For these purposes, the framework analyses urban governance, examines the direction of investments in development projects and identifies interlocking network models in order to investigate the spatial use of company networks. It explores how urban space is perceived by

the individuals who work in the new economic sectors in order to provide insight into the extent of their attachment to the city. In this regard, Henri Lefebvre's triad of space production, consisting of conceived, perceived and lived space, can be used as a basis by translating it into a model that describes the urban environment as a product of decision-making, spatial practice and identity.

### Knowledge Economies as Key Drivers of Spatial Development in Emerging Cities

Since the 1970s cities all over the world have been competing to become international service centres within growing global networks. These 'global cities' (Sassen, 1997) have become the main drivers of the world economy and junctions through which flow transactions of people, goods and information (Castells, 1996, p. 376). This phenomenon was made possible by the introduction of new infrastructural technologies such as aviation, fibre optic wires and satellites (Witlox, Derudder, 2007, p. 36). Thus, for any new player to be successful in entering the global network it must invest in the establishment of infrastructure that will enable it to access foreign markets and producers. To be a truly key hub within this global network however the emerging city must attract the business of international and trans-national firms as well as ideally their headquarters in order to diversify its economy toward independence from heavy industries and the export of natural resources (Alderson, Beckfield, 2007, p. 26).

This kind of innovative evolution in a city's economy is highly dependent on and driven by the presence within it of a population equipped with the knowledge and ambition to create and sustain new and diverse sectors and services. In

turn, knowledge-based innovation and creativity is highly attractive to the kind of international firms needed to make an emerging city a contender on the global playing field, for companies to require and recognise knowledge and innovation as a valuable and important resource. However, studies have shown that such innovation is highly active in only a small number of urban areas (Simmie, 2001). These particular urban areas benefit from what Malecki (2000) describes as the 'local nature of knowledge', whereby members of a knowledgeable population in close geographical proximity to one another share their knowledge and support in direct and close interaction. Malecki thus highlights the necessity of accepting the importance of the factor of space in relation to the role knowledge plays in the competition between cities (Malecki, 2000).

One of the challenges that emerging cities face in this competition is that many sectors of the knowledge economy, particularly the advanced producer service sector (Beaverstock, 2007, p. 65), are centralised in and monopolised by the existing global cities that already possess the advantages described above. Consequently, emerging cities are engaged in fierce competition for international investors to accelerate and generate the urban growth required to become the kind of agglomerations that would attract the relocation or establishment of international companies (Gaebe, 2004, p. 33). In this regard, tourism is a commonly used strategy to initiate urban growth and is regarded as a marketing tool to attract investment. This is often referred to as 'city branding' (Dinnie, 2010). This strategy includes investment in multi-mode transport systems, cultural facilities and the development of services and amenities. In addition, the expansion of transportation capacities is needed to transform

cities into global and regional trade hubs. Due to the high demand that public investments must cope with, governments are in many cases forced to privatise and decentralise urban development (Savitich, 2002) by selling state-owned land to investors and their developers. This is usually accompanied by a relaxation of financial regulations and of restrictions regarding building permits in order to accelerate construction growth.

This type of strategy to generate urban growth is a common practice in many parts of the world although it is always in danger of missing the balance between the short-term interests of speculators and long-term plans to achieve urban consolidation. While certain kinds of companies and businesses are attracted to have a degree of presence in emerging cities because of construction booms and the expansion of financial markets, they are unlikely to relocate their headquarters without a high degree of urban consolidation already present. Thus, the major challenge faced by cities is to develop a built environment that integrates all the aspects of the liveability and sustainability that would draw long-term investment (Boddy, Parkinson, 2004).

This high-quality built environment is crucial to a city's development toward becoming an international service centre. Without a large body of qualified workforce successful economic diversification is not possible for in contrast to other economic sectors, companies in knowledge economies are highly dependent on the long-term employment of qualified staff (Sassen, 1997, p. 140). However, in contradiction to this need, the decentralisation being carried out in many emerging cities to attract investment and related speculative interests are causing a decrease in



urban quality. In many cases a segregated and privatised urban landscape has been created lacking integrated public services and amenities. Thus, governance in emerging cities is facing the major challenge of keeping the urbanisation process under control despite the pressure to privatise and deregulate in order to become more competitive globally (Hackworth, 2006, p. 40).

### Overview of Contemporary Urbanism in the Gulf – the Case of Doha

The initial success of Dubai's development model for establishing a regional hub by liberalising local markets during the 1990s had a huge impact

on the entire region. It seemed to introduce a fast track on how to diversify Gulf economies and enter global networks. One of Dubai's early competitors was Qatar and its capital Doha, the rulers of which were keen to diversify economy and services by building on a limited but key number of elements in contrast to Dubai's less discriminating approach. While Dubai has pursued development in almost all its economic sectors in parallel, Doha focuses on specialising in its main sectors only and developing its future economic role in the global network gradually. In this respect, exclusivity defines its economic development strategy rather than undefined expansion (Adham, 2008, p.248). While international sport events and investment in cultural projects have been attracting regional



Figure 2: Souq Waqif; Doha's traditional market manifesting its emerging cultural role (Source: Authors).

and worldwide attention, the development of Al Jazeera as one of the largest news providers in the Middle East is part of a long-term plan to occupy a role as a global information hub.

Doha is currently reinventing its cultural role through its investment in museums, for example, the Museum of Islamic Art, and projects such as

the Katara Cultural Village (QSDP, 2011, p. 204). The redevelopment of Doha's traditional Souq is another significant project within its strategy to integrate the past and the regional culture into its development as an international service centre (Figure 2). Parallel to the attempt to specialise as a centre of Arab arts, sport events have become a major aspect of Qatar's expanding tourist



Figure 3: Residential high-rise exclusive development--The Pearl. (Source: Authors).

industry. Since hosting the Asian Games in 2006 and the development of Sports City, many new projects have been initiated including bids for the 2020 Summer Olympics as well as the 2022 FIFA World Cup, which was awarded to Qatar in 2010, adding a new dimension to Qatar's effort to become a global centre for sport events.

Qatar's efforts to market itself as a new tourist hub in the Arab region has been accompanied by large investments in infrastructural projects such as the new international airport as well as the expansion of Qatar Airways. The international airport is expected to be completed in various phases by 2020, after which it will have an expected annual capacity of about 50 million passengers (The Edge, 07/2011, p. 45). This expansion of its aviation industry coupled with its long-term tourism strategy has put its capital on the map of regional and global investment.

In contrast to Dubai, Doha's real-estate market has never been as liberalised and freehold developments have remained restricted to certain areas. The most prominent example is the 400-hectare reclaimed island known as 'The Pearl' (Figure 3), which offers freehold properties on leasing contracts of 99 years (Colliers International, 2008, p. 1). While residential developments have been located mainly in the north of the city, the new Financial District at the Corniche, also known as West Bay, has become the centre of commercial developments with its high-rise towers. The evolving skyline expresses an attempt to become an international service hub, particularly designed for advanced producer services such as the financial industry. Over the past few years, more and more residential high-rise developments have been built in the West Bay, adding a new residential typology to the

city. Rapidly increasing land prices have caused an increase in building heights. Notably, a large number of tenants are companies that rent apartments for their international employees.

One of Doha's pioneering efforts was the early integration and development of the education industry in order to generate knowledge for future economic sectors. In 1995 the Qatar Foundation was established with the mandate to develop what is currently the largest education project in the Gulf known as Education City. Although Dubai and other cities in the region have reacted to this strategic move with similar projects, the Education City project has succeeded in attracting five well-known US universities which saw Doha as an optimum location for their expansion strategies within the Arab and Asian markets. The approximately 2,500-acre compound in the north-east of Doha will after its completion integrate housing, shopping and recreational facilities in addition to a wide range of educational institutions. It works closely with the companies and organisations in Qatar Science and Technology Park, which was set up on the basis of free zone incentives and intended to create an attractive recruitment opportunity for high-tech firms that rely on specialised staff (Adham, 2008, p. 243). This initiative illustrates the groundwork undertaken over the last several years aiming to develop an environment that supports the future prosperity of knowledge economies. Investment in education with the goal of developing a home-grown elite of qualified workforce is key to transforming a place into a knowledge hub.

One unique aspect of contemporary urbanism in the Gulf is the generation of cities in the desert supplied with state-of-the-art infrastructure intended to attract global immigration and



Figure 4: Doha's explosive urban growth between 1988 (left) and 2010 (right) (Source: Google Earth and MMUP).

transform these newly built shells into vibrant business centres (Figure 4). The possibility of applying this approach to the development of cities from scratch is enabled not only by the remaining wealth of fossil resources but also by the potential of the Gulf's geopolitical location close to rising markets in Asia. While in global cities urban governance has reacted to expanding knowledge economies by accommodating their specific needs, leading to a morphological transformation of cities, urban governance in Gulf cities has been the initiator of space for evolving economic interaction. This can be seen in the recent public investment in the development of infrastructure and the introduction of marketing strategies to attract international attention. Subsequently, cities themselves have become brands for investment and rulers have found

themselves in the role of CEOs managing urban development as a 'business idea' (Davis, 2007, p. 61). The majority of the knowledge-economy companies that initially relocated to the Gulf in connection with the execution of these 'business ideas' were mostly investment banks and construction-related companies. The employees of these companies were largely given limited working contracts and project-based perspectives.

### A Framework for Analyzing Urban Qualities in Doha

Henri Lefebvre's theory of space production can be utilized as basis for a framework that combines analyses of all the various factors that impact urban development. Lefebvre expressed his idea

of the production of space using a triad consisting of conceived, perceived and lived space. Firstly, Lefebvre defined 'conceived space' as the space conceptualised by scientists, planners, social engineers, etc., also known as 'representations of space'. These representations are abstract as they are rooted in the principles, beliefs and visions held by such practitioners, decision makers and others who are in a position to impose their personal notion of 'order' on the concrete world and so create a practical impact on space within social and political practice (Lefebvre, 1991, p. 41). 'Perceived space' is the space of 'spatial practice', which Lefebvre defined as the space where movement and interaction take place, where networks develop and materialise. Thus, it includes both daily routines on an individual level and urban realities such as the networks that link places designated for work, leisure and 'private' life (Lefebvre, 1991, p. 38). Lastly, 'lived space' is understood by Lefebvre as the unconscious, non-verbal direct relation between humans and space. Also known as 'representational space', it is directly lived through associated images and symbols (Lefebvre, 1991, p. 39). Products of representational space are often symbolic works such as art, design and aesthetic trends (Lefebvre, 1991, p. 42).

Based on Lefebvre's ideas, the production of urban space can be analysed by investigating each factor in this process using the perceived-conceived-lived triad. Thus, all the factors that affect the nature and structure of the urban fabric in the production of space in emerging cities such as Doha can be sought for and examined with a special focus on understanding the role of knowledge economies and their impact. Thus, a framework has been developed in which all aspects are analysed utilising various

methodologies in order to investigate the development of urban qualities in direct relation to factors that weaken or strengthen them (Figure 5).

Due to its predominant role within the production of urban space in emerging cities, conceived space is analysed as a first methodological procedure. Conceived space is understood to be the effects on space resulting from the decisions that pertain to urban governance. It is mainly based on the plans generated by planners and other groups involved in the process of urbanism derived from their knowledge, ideas and visions. Thus, the role of urban planning should be comprehensively analysed and evaluated. This includes plans used by governance as the basis of urban development, as well as the process of decision making based on the assumption that the structure of urban governance itself is consciously designed. In this regard, it is important to understand how physical planning relates to the context of theoretical ideas about urbanism, for each plan is the outcome of a planning culture and is therefore imbued with more meaning than its role as a technical document might suggest. The analysis of conceived space therefore seeks to answer the question of which ideas and plans constitute the basis for the building of a city and with regard to the particular issue of knowledge economies, how these ideas and plans address the need for economic diversification.

**Urban Governance Model:** Decision-making models illustrate the cooperation within public institutions as well as the specific degree of privatisation within urban development. The models provide insights into the complexity of governance and its public, private and semi-privatised entities as well as their internal structures.

Interviews with various professionals working in urban governance are necessary to translate the decision-making structure, which is an essential element of conceived space, into an abstract governance model.

**Planning Analyses:** Strategies that are being implemented as part of economic policies have to be analysed by reflecting their impact on the physical environment. Investigations of these urban development strategies are needed in order to understand how the city will be transformed and thus how the existing built environment is conceived by decision-makers. In this regard, interviews are combined with analyses of strategic visions and physical planning in order to explore the contemporary planning philosophy.

While conceived space is the result of governance, perceived space is the result of the spatial practice of all the 'users' of a space. Spatial practice can be empirically analysed by investigating movements and networks. In emerging cities three types of users have the most impact on the production of space, namely, companies, employees and investors. Thus, it is important to analyse company networks, the movement of employees and the direction of investments. The choice of location is itself already part of the spatial practice of any company and is made based on the facilities that are available, accessibility, economic aspects such as rent and marketing considerations as well as proximity to other companies due to the common practice of outsourcing within knowledge economies (Lüthi, Thierstein and Goebel, 2010, p. 117). Because of the differing degrees of significance of companies it is important to analyse and categorise their functional role and hierarchical

status within regional and global networks. With regard to the movement of company employees, this is determined by their choice of residence and its location, their choice of amenities and services and their choice of transport. As well, private investment in urban development needs to be analysed since it is an important factor in the production of space in emerging cities. Thus, the question of how a city works and how a city is used can be answered by analysing the spatial practice of the key actors that together produce the space.

**Company Network Analyses:** Network models are needed to understand the impact of global network economies on the urban system of emerging cities. These models will be generated by investigating the spatial practice of companies regarding their location choices and network development. In this regard, location behaviour has to be brought together with a value-chain approach. First, how multi-branch and multi-location companies develop their intra-company networks on various spatial scales will be examined using Peter Taylor's interlocking firm network model (Taylor, 2004). Secondly, it is important to identify the partners with whom these companies have working relationships along individual chains of value and where these extra-company linkages are located by using a web survey. Lastly, a series of face-to-face interviews with managing directors needs to be conducted in order to reveal case-study evidence regarding the strategic networking of knowledge-intensive enterprises (Thierstein and Schein, 2008, p. 184).

**Employee Movement Analysis:** Investigating the spatial practice of individuals working in knowledge economies helps to understand the quantity of choices regarding amenities,

residencies and working places as well as their locations within the city. The resulting movement patterns can be translated into models illustrating which spaces are used and which spaces are avoided by qualified workforce. The basis for these models are questionnaires to be distributed to a representative number of participants with various cultural backgrounds.

**Investment Pattern Assessment:** Analyses of how investors use space (in legal and physical terms) to generate wealth are needed to understand investment patterns within urban developments. Therefore recent development tendencies within the real-estate market as well as private shares within infrastructure projects are assessed by reflecting their impact on the built environment.

In most urban studies the influence of lived space on the production of urban space has been neglected due to the difficulty of measuring its role scientifically. Lived space is understood to be the subjective personal relationship of inhabitants to their cities that affects their active involvement and investment in the place. It is expressed in symbols and associations and has a major impact on the coherence and continuity of a society and thus on urban development. While in cities with long urban histories lived space is often neglected as a major factor in spatial development due to the implicitness of its existence, in the case of emerging cities a lack of lived space is expressed in the form of an intense struggle for identity and a relatively low degree of participation by inhabitants in development decisions. One consequence of this vacuum in cities that are built from scratch is branding with certain images in order to attract investment. Thus, an analysis should be made

of the images that the inhabitants of emerging cities associate with urban areas and whether this is coherent with the city's marketing strategy. The image of a city can be influenced by conscious planning but it is also affected by spatial practice for vice versa the image of a city held by its inhabitants has an impact on planning. Analysing lived space thus uncovers what identity a city has and what images the city is associated with.

**Photographic Survey Interviews:** In order to obtain insight into how the city is perceived photographic surveys are used as the basis for questionnaires in which inhabitants are asked to interpret certain images of typical scenes in the city. In this regard, a significant number of employees working in knowledge economies have to be selected as participants.

**Behavioural Mapping:** By investigating the behaviour of inhabitants the attractiveness of certain urban spaces can be empirically understood as indices for their subjective attachments. Thus, behavioural mapping will be used to investigate how inhabitants make use of a selection of representative spaces within the city by observing these spaces at various times of the day and days of the week.

In sum, a comprehensive analysis of the conceived, perceived and lived space should determine the main spatial factors involved in the urban development of an emerging city and contribute to an understanding of the impact of each factor on the built environment. Therefore, the built environment itself needs to be analysed in order to investigate the development of urban qualities by examining the transformation process over a significant period of time.

**Urban Structure Analyses:** These analyses are needed to define the urban structure that existed before the start of the process of economic diversification, the current urban structure and the projected urban structure of the future based on plans. In addition to analyses on a city scale it is postulated that case-study areas be chosen for analyses on a smaller scale in order to investigate the impact on a local level. These analyses should ideally cover land use, infrastructure and typologies as well as urban densities.

**Space Syntax:** Another important aspect to be analysed is the accessibility of areas within the urban fabric using Bill Hillier's methodology of 'space syntax' (Hillier, 1998). Changes in the structure of the urban fabric, for example, the integration or isolation of certain areas, should be referred back to the previously defined spatial factors.

Consequently, negative and positive development trends can be identified and investigated in direct

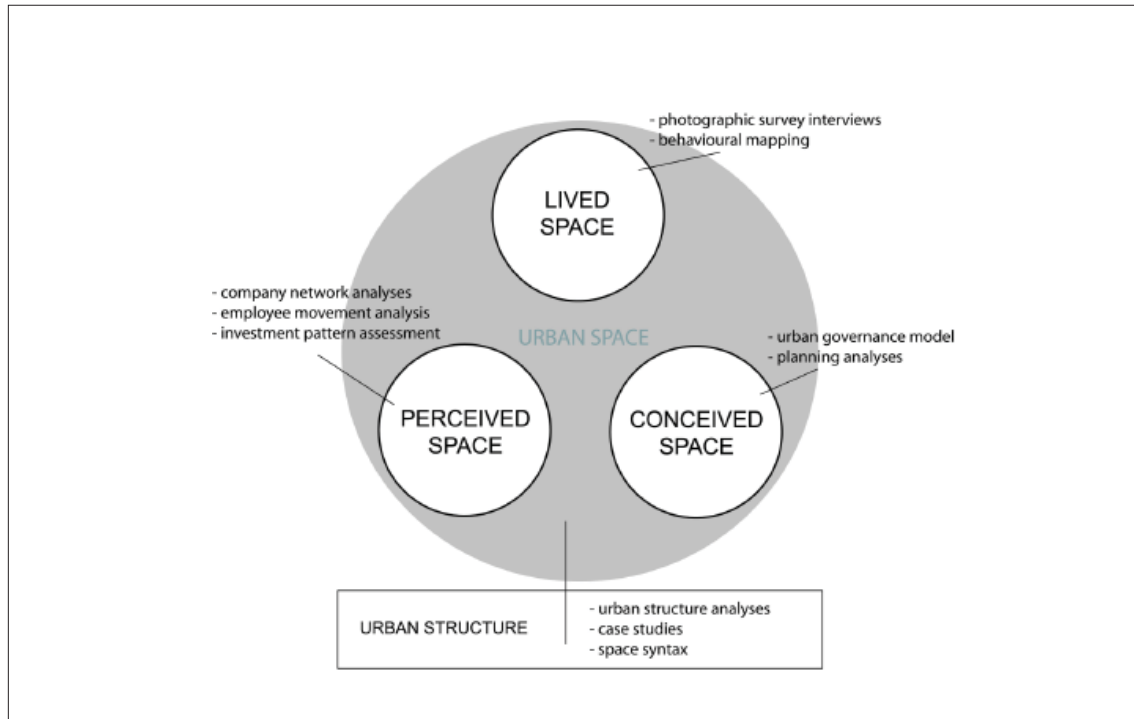


Figure 5: Framework for analyzing urban qualities in Doha. (Source: Authors).



relation to their causes. An evaluation of these analyses will lead to a grasp of the urban qualities and deficits and can therefore be used as a basis for SWOT analyses. Hence, this framework is designed to foster an understanding of the complex relationships within the urban space of emerging cities as well as to detect the urban qualities that support the emergence of knowledge economies.

### Conclusion

The strategy of diversifying the economy by deregulating policies in combination with public investment in infrastructure and cultural facilities is a challenging development path for Gulf cities such as Doha. While on the one hand this strategy has proven to be effective for accelerating urban growth and branding a city with a global image, it remains unclear how the qualities of cohesiveness, diversity and effectiveness can be integrated into the city's urban structure. Without such consolidation, Gulf cities risk becoming inefficient and fragmented entities that are increasingly less able to remain attractive for knowledge economies. In this respect, the proposed framework seeks to deliver a theoretical basis for comprehending the complex interdependencies between current diversification strategies and their impact on urban qualities. It is based on Lefebvre's triad of space production, a frequently used reference in contemporary urban research. His idea of urban space as a product of proactive space planning, movements in space and the identification of inhabitants with their space underlines the importance of understanding cities as evolutionary and non-static. Thus, using a wide range of interdisciplinary research methods, the framework is designed to comprehend all the various factors that impact the transformation of urban space.

While in the past modern urbanisation was mainly guided by centralised planning and thus the conceived understanding of urban space by decision makers, urbanism in the Gulf has entered a new phase where inhabitants need to become a more important factor in spatial transformation. This need has been generated by the strategy of establishing knowledge economies as the basis for future prosperity, which involves a qualified workforce becoming the new economic resource. This emerging social group demands the freedom to participate in urban development by exercising individual choices with regard to residence, amenities and means of transport. As a result, there have been recent attempts to diversify residential typologies, to establish various kinds of entertainment and to develop the first public transport systems. However, due to increasing land prices developments have largely been limited to luxurious standards for high-income groups, leading to segregated and privatised urban spaces and a general lack of cohesion and integration. Today, most medium-income groups find themselves in apartments or villas in compounds rented by their employers in the outskirts of Doha at far distances from public spaces and services. These distances in combination with a dependency on the car as the main means of transport have led to increasing traffic congestion and thus decreasing liveability in many areas.

Thus, contemporary urban research in the Gulf needs to focus on the various interdependencies between liveability and economic diversification by analysing and evaluating all the factors that impact the transformation of urban space. The current development strategies and their focus on rapid urban growth have caused both decreasing urban qualities due to a lack

of consolidation and increasing qualities in certain areas such as waterfronts. In order to understand the complexity of all the factors at play within the current development process, in-depth investigations need to be carried out using comprehensive frameworks such as the one proposed.

### Acknowledgement

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## SMALL URBAN GREENERY: MAPPING AND VISUAL ANALYSIS IN KYŌJIMA-SANCHŌME

Jorge Almazán, Darko Radovic, and Tomohiro Suzuki

### Abstract

This paper illustrates the practice of maintaining small greenery in a typical high-density, low-rise district in Tokyo through extensive mapping and systematic photographic analysis of vertical green coverage. Overlooked by statistics based on aerial photography, this paper describes small greenery and the way in which it improves urban scenery. As more cities are planning to increase their green surface, this paper aims to bring attention to the potential role of environmental and social sustainability played by small-scale vegetation. Such greenery, spontaneously cultivated by residents, not only contributes to embellishing the streets, but also serves as a social device to personalize and subtly characterize territories, while expressing the creativity and cohesion of the community.

### Keywords

Greenery; Mapping; Vertical green coverage; High-density; low-rise

### Introduction

#### Background and purpose

Throughout history, greenery has been considered an indispensable element in architecture and urban design because of its environmental, aesthetic, and recreational benefits. Even in the revolutionary avant-garde developments of the early 20th century, which aimed to make a radical departure from previous ideas on architecture and urbanism, vegetation was a dominant feature, such as in Ebenezer Howard's Garden City and Le Corbusier's Radiant City.

Today, studies on sustainability emphasize the multiple environmental benefits of greenery in urban environments: climate modification, carbon sequestration, ozone reduction (and consequently smog reduction), dry deposition of NO<sub>x</sub>, O<sub>3</sub>, and PM<sub>10</sub> particulates, decreased rainwater runoff, and protection against flooding (Ong, 2003: 198). This thesis aims to inspire practitioners and contribute to the understanding of the relationship between greenery and the everyday practice of space through a case study in Tokyo.

### Relevance

The relationship between vegetation and spatial practice was neglected in the modernist predominant tower-in-park typologies inspired by Le Corbusier. Postmodern theory has extensively exposed how such housing developments, originally designed as parks and gardens, too often ended up as abandoned spaces due to neglect and lack of care by their residents.

Tokyo is an example of a city in the midst of an intense debate on means to introduce more greenery. Recent residential developments are following the model of free-standing towers in open green spaces (Almazán and Tsukamoto, 2006). At the same time, there has been a boom of high-tech green facades and rooftops on office buildings, often as a demonstration of eco-friendliness. Several studies have shown the high running costs of these greening systems and the need to explore feasible greening methods for

residential areas (Hirayama and Nakai, 2002; Shimomura, 2002; Espec Corp accessed in 2011). Considering the background of this ongoing debate, this paper aims to emphasize the relationship between greenery, architecture, and the practice of everyday life as an alternative to both tower-in-park and expensive greening systems for residential areas.

The notion of spatial practice, proposed by Lefebvre in 1974 (English translation in 1991) and developed by de Certeau in 1980 (English translation in 1988), stresses everyday life activities and the importance in the social construction of urban space. This paper documents a specific spatial practice in Tokyo, which can be found in many neighborhoods, by focusing on one clear case: an area with extremely narrow streets, high population density, and few open green spaces, but an area that nevertheless is often considered as having green character.

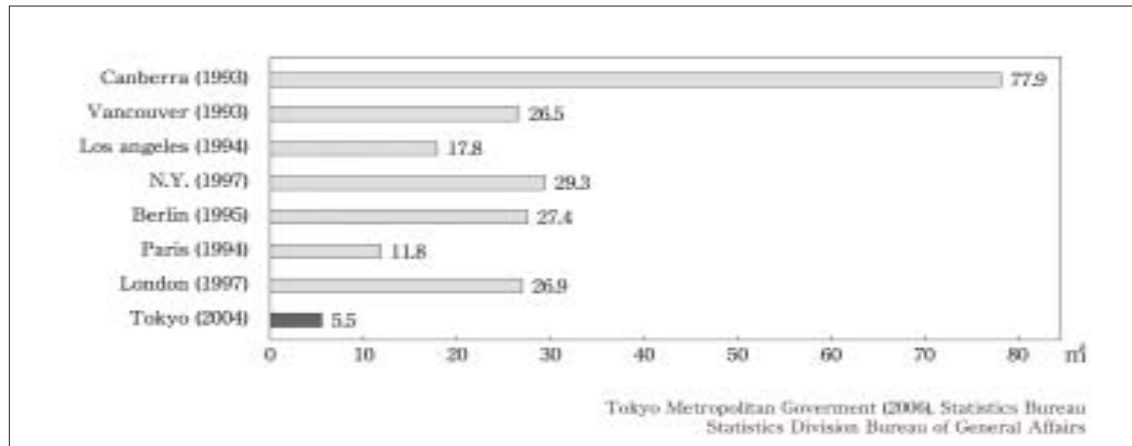


Figure 1: Area of public green spaces per capita in Tokyo and other capitals (Source: Tokyo Metropolitan Government, Statistics Bureau, Statistics Division Bureau of General Affairs, 2006).

### Current condition of greenery in Tokyo

Tokyo (officially 'Tokyo-to', i.e. Tokyo Prefecture) is divided roughly into the densely populated 23 special wards in the east and the almost rural Tama Area in the west. As of 2000, the rate of green and natural areas including rivers was 29% in the 23 wards and 80% in the Tama area (TMG, 2001). Although, the Tama Area is part of Tokyo Prefecture, 'Tokyo' in this paper refers to the 23 wards, the most densely populated urban area.

The percentage of green space in the 23 special wards is considered low by the authorities, and official policies often stress the necessity of increasing green surfaces. According to data from the Tokyo Metropolitan Government, planned green space and park space is extremely low in Tokyo prefecture compared with other major cities around the world (See figure 1).

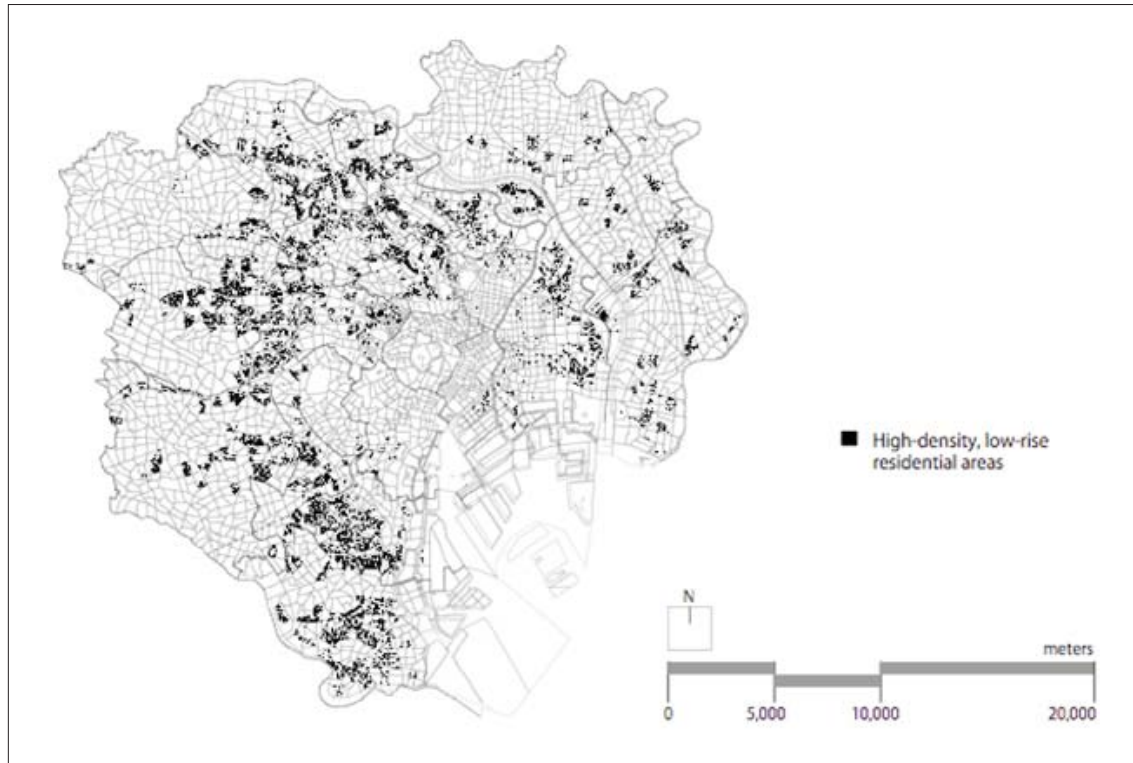


Figure 2: Location of high-density, low rise areas according to Mizuguchi et. al (2011).

Major green surfaces in Tokyo are found along rivers and in parks. Greenery was historically connected with waterways, many of which disappeared during the 20th century, although there are still small linear green spaces along rivers flowing through the city (e.g., Nihonbashi River and Sumida River). Linear parks on the embankments of big rivers (e.g., Tama River and Ara river) have preserved their green character and play an important role in the city not only for recreation, but also as evacuation areas in the case of earthquakes and fires (Sejima Lab, 2008).

Regarding parks, most contemporary parks originated in the Edo period on private enclosed residences and garden precincts of feudal lords (e.g., Yoyogi Park, Shinjuku Gyoen National Garden, and Hamarikyū Onshi Teien). Today, these parks are public but they have retained their character by remaining isolated from the surrounding streets (Kitayama, 2005: 83–94).

Japanese traditional houses and suburban developments incorporating private gardens contribute to the overall green atmosphere. However, many housing lots have lost much of their gardens over the last century, mainly due to the gradual subdivision of lots as a result of high inheritance taxes (Kitayama et al., 2010: 38).

The disappearance of waterscapes, isolation of parks, and the gradual loss of residential gardens, as well as statistical comparison with other cities, might have contributed to the perception that Tokyo lacks greenery. However, this point of view often overlooks the smallest range of vegetation, which seems to thrive in densely built-up residential areas through innumerable planters and pots. A precise determination of the boundaries of

these areas and the conditions that create this phenomenon are beyond the scope of this paper. However, an approximation of the location can be found on the map of Mizuguchi et al. (2010) showing “high-density low-rise residential areas in Tokyo” (see figure 2), where a high population density is defined as 200 persons per ha or more, and low-rise is defined as residential buildings up to 10m high.

### Case Study: Kyōjima-Sanchōme Selection criteria

Kyōjima-sanchōme (Sumida ward - Tokyo) was chosen as the area for fieldwork for the following two reasons: First, it can be considered a representative case because it is a prime example of a high-density, low-rise residential area (see table 1); and secondly, because it has one of the lowest green space coverage rates in Tokyo, several studies on this area have emphasized the presence of greenery. Through a series of visits, the authors came to identify greenery as a key aspect underlying the attractiveness of the place.

The clarity of Kyōjima-sanchōme's urban morphology and the seemingly contradictory perception of vegetation make Kyōjima-sanchōme a case worth exploring in order to extract more general conclusions on the relationship between greenery and the everyday life practice of space.

Kyōjima-sanchōme	
Population	4594 (2275 men, 2319 women)
Area	18 ha (0.18 km <sup>2</sup> )
Density	255.22 pers./ha
Average age	48.8 years
No. of Households	2063

Table 1: Urban parameters of Kyōjima-Sanchōme (Source: Authors).

### Historical background of Kyōjima

First, it is necessary to clarify the Japanese address system to understand the boundaries of the area. Cities in Japan are subdivided into chō or towns, which are subdivided into chōme or districts. Kyōjima-sanchōme (meaning third district of Kyōjima town) is a sector in the larger area of Kyōjima.

Kyōjima was an area of paddy fields and marshes in the surroundings of Edo (name of Tokyo before the Meiji Restoration). Development started at the beginning of the 20th century with the construction of two railway lines and the establishment of several small factories. Damage caused by the 1923 earthquake was comparatively low in the area, and Kyōjima rapidly became a residential area as tenement houses were constructed to accommodate those in central areas who lost their houses. Without urban planning, the emerging development traced the patterns of former irrigation brooks.

Allied bombings during WWII destroyed large areas in central Tokyo, but again Kyōjima was one of the few undamaged areas, and people moved in. The population increased gradually, and in 1965 the town's high density and fire risk due to narrow streets and wooden structures

motivated the central government to declare Kyōjima as part of the Disaster Prevention Program (History sources: Rojikomi Map 2004; PPS accessed 2011).

Visits to Kyōjima by the authors in November and December 2010 suggest that the area has retained its economic vitality through a vibrant commercial street, the Tachibanaginza that crosses through the center of the district. However, the population decline, the decrease in the number of small factories, and the risks related to earthquakes seem to pose serious challenges to maintain this vitality.

### Green Area Rate

Green space coverage, extracted from aerial photographs, shows that the three adjacent wards of Sumida, Chuo, and Taito have the lowest ratio (<10%) of the 23 special wards (see figure 3). Most of the areas in these wards, which are located east of Imperial Palace (old Edo castle), correspond roughly to the so-called shitamachi (low city) or commoner districts of the Edo Period. Although, Chuo ward contains residential areas such as Tsukishima rich in greenery, most of its surface is composed of commercial areas like Ginza or office areas like Yaesu and Nihonbashi. Taito ward, famous for



historical sites like Asakusa and Ueno, contains districts such as Nezu and Yanaka rich in greenery, and Sumida has long linear parks along the rivers that form its boundaries. However, both Taito and Sumida wards are composed mostly of urban developments with a high building coverage.

In Sumida ward (see figure 4), Kyōjima is the chō with the lowest green space coverage (3.6%) (Sumida Ward 2010). The study area has an even

lower ratio. From the aerial photograph (dated June 6, 2010; Google Earth), the green surface visually recognizable as vegetation has been extracted, and the green coverage rate has been calculated from the number of pixels (see figure 5). The result is 3.2%, which is lower than the 3.6% of Kyōjima. Kyōjima-sanchōme is thus a prime case of scarce greenery when seen from an aerial perspective.

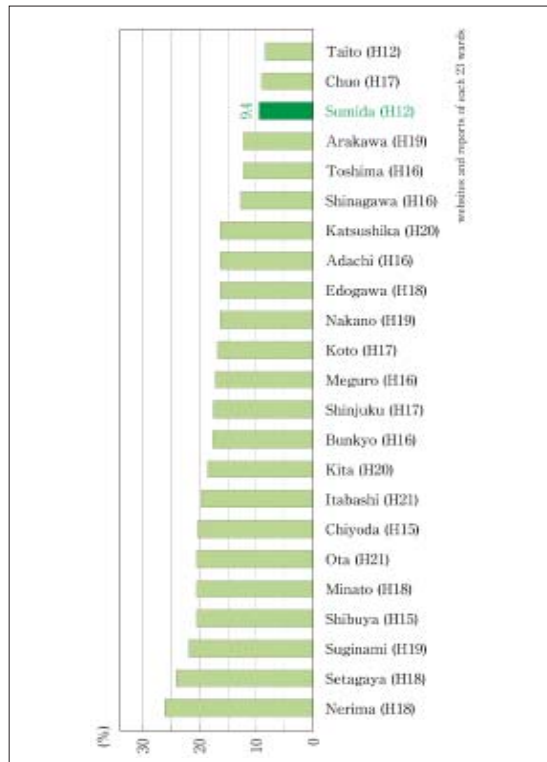


Figure 3: Ratio of green space coverage in the 23 special wards of Tokyo (Source: extracted from online reports of each ward, see websites in the reference list).

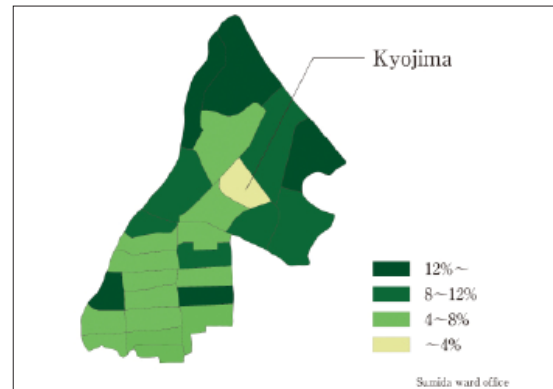


Figure 4: Ratio of open green space coverage by town in Sumida ward (Source: Sumida Ward website).

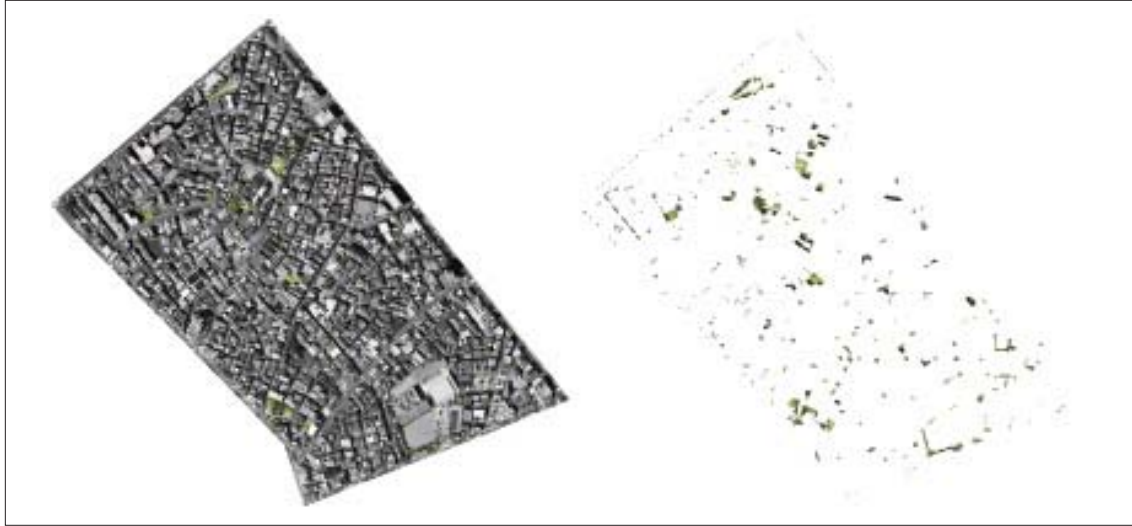


Figure 5: Left: aerial photograph of Kyōjima-sanchōme; Right: extracted greenery - green space coverage ratio 3.2% (Source: Authors).

### Fieldwork Investigation

Several studies have identified greenery as an important element of Kyōjima's identity (Tanaka and Nozawa, 2007; Ishizaka and Yamaga, 2008; Rojikomi Kyojima Production Group 2004). This however seems contradictory because the green space coverage is among the lowest in Tokyo. This study maps and examines the visual experience of small greenery which seems to be a decisive factor for clarifying this apparent contradiction.

The green space coverage as seen in an aerial photograph does not seem to reflect the level of greenery visible at eye level on the streets of Kyōjima-Sanchōme. The following two types of graphic documents were developed to clarify the specific patterns in which greenery appears and to further understand the experience of greenery from the street view: a complete greenery map

of the area, including extra-small greenery; and photographic samples.

### Mapping

Maps were created by plotting the position and type of greenery while walking through the area from November through December 2010. Vegetation was classified according to its visual impact from an eye-level perspective into the following six categories according to volume and height: 1. trees; 2. bushes; 3. hedges; 4. pots; 5. thickets; and 6. low growth. This classification system deliberately ignored the species of vegetation to ensure that the focus was spatial impact in relation to humans. The resulting map, showing all types of greenery and streets is shown in Figure 6. Streets were classified into the following 3 types according to width: Primary (> 4m), secondary (2.5 - 4m), and tertiary (< 2.5m).



Figure 6: Complete map of greenery seen on the streets and in relation to street type (Source: Authors).

### Results of mapping

From the maps, each type of greenery was quantified (see table 2), and the following findings were obtained.

- Trees, hedges, and low growth were observable in aerial photographs; pots and thickets were not.
- High trees appeared along the perimeter streets, on elementary school ground, and in small public parks (often called in Japanese pocket parks).
- Hedges were located around pocket parks and in the vicinity of larger collective housing.
- Low growth covered vacant lots. The presence of non-occupied lots is quite common in Tokyo, where houses have an average life of 30 years and where the city is said to be continuously being rebuilt or 'metabolizing' (Kitayama et al., 2010).
- Small greenery was scarce around bigger buildings such as clinics, public baths, and collective housing buildings. The presence of pots seems directly related to the front of detached houses, which have footprints of 20 - 60 m<sup>2</sup>.
- The most prominent result was the number of pots observed (910), distributed extensively

throughout the area and located mainly in the narrower tertiary streets. The small street scale seems to invite residents to personalize their alleys. - The amount of pots decreased in streets  $\leq 1.5$  m wide, likely because plants in such narrow streets obstruct traffic. In some cases, plants were used to demarcate boundaries in an obvious manner to avoid people from crossing them. Observations suggest that when a street narrows to  $\leq 1.5$  m, it becomes more of a gap between houses than a conventional street, and personalization of house fronts receives less attention by residents.

As could be expected, the narrowness of streets and the small individual houses incentivize the personalization of street spaces through pots. The density of the area in this case is such that whole sectors of streets are fully covered by greenery placed spontaneously by residents.

		Primary >4 m	Secondary (2.5-4 m)	Tertiary (<2.5 m)	Open space	Amount
Visible in aerial photographs	<b>Tree</b>	133	57	72	<b>143</b>	405
	<b>Bush</b>	44	173	<b>276</b>	169	662
	<b>Low growth</b>	-	-	-	-	1208 m <sup>2</sup>
	<b>Hedge</b>	69	36	25	8	138
	<b>Hedge-total length (m)</b>	<b>374.0</b>	356.9	205.1	77.9	1013.8
Not visible in aerial photographs	<b>Thicket</b>	19	57	<b>127</b>	118	321
	<b>Pot</b>	120	292	<b>426</b>	72	910

Table 2: Quantity of each type of greenery by street type (Source: Authors).

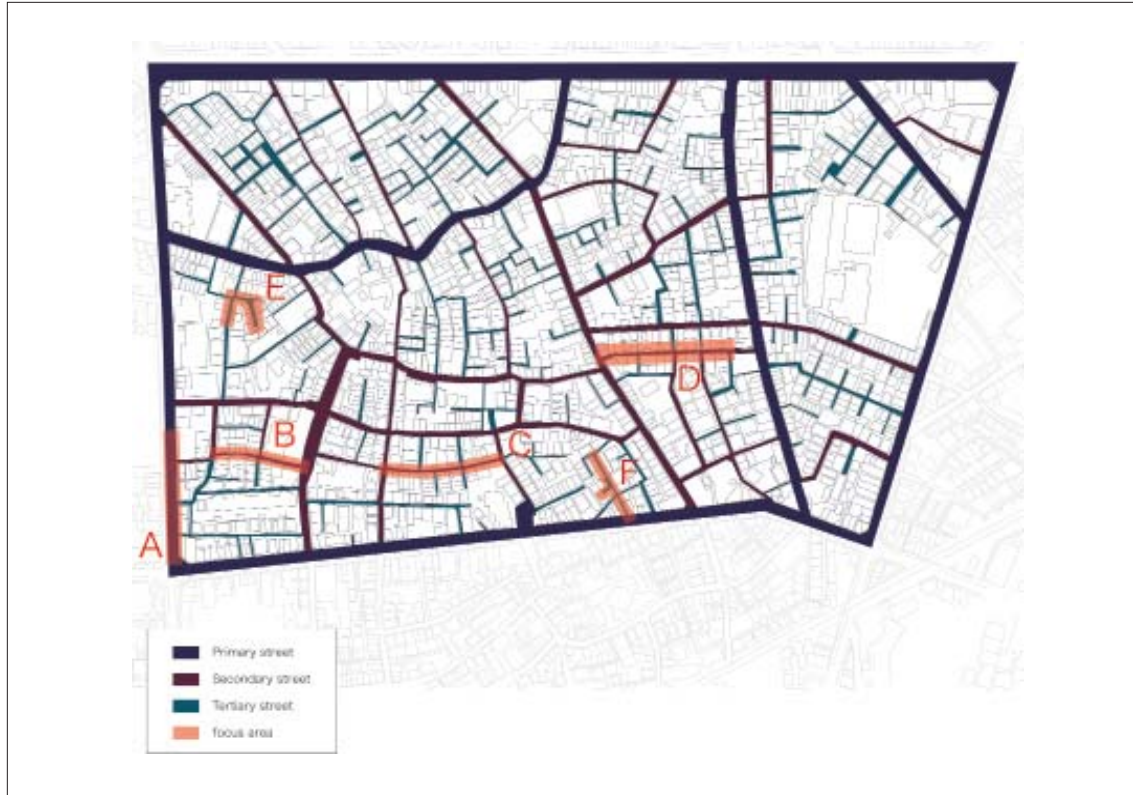


Figure 7: Selected street sections for visual analysis. (Source: Authors)

### Visual analysis

The mapping helped to understand the distribution of greenery and its relationship to buildings and street width. However, the maps were unable to describe the visual experience of space. Six streets were chosen as samples (See figure 7). This sampling does not aim to be exhaustive, and conclusions will be treated as suggestions. However, as a first approach to this complex phenomenon, a series of clues or insights can be extracted through the

analysis of the samples. These extracted variables can be applied to other street spaces in future research.

- A: Primary streets (4 m). The selected section is a random sample of the perimeter streets forming the boundaries of the district. On-site observations showed that there were no major visual differences along these streets and therefore the selected section can be used as a representative of this type.

- B, C, and D: Secondary streets (2.5–4.0 m). These streets constituted the bulk of streets in the district (Table 3). Each street was slightly different and all contained all types of greenery. However, the sampled streets were selected to reflect subtle differences. B had a prominent presence of hedges, C was full of small pots, and D had a comparatively higher number of trees.

- E and F: Tertiary streets (<2.5 m). Compared with the secondary streets, tertiary streets presented a predominance of small greenery, especially pots. For sampling, two streets were selected with very little in common: E is a dead-end with few pedestrians, whereas F is connected to a primary street.

	Length (m)	Area (m <sup>2</sup> )
<b>Primary</b>	2,659.7	5,697.8
<b>Secondary</b>	3,386.7	11,657.9
<b>Tertiary</b>	4,860.3	8,013.8
<b>Total</b>	10,906.7	25,369.4

Table 3: Length and area of each type of street (Source; Authors).

### Visual analysis method

To examine visual experience, vertical green coverage was applied. Vertical green coverage is an index that measures the amount of greenery and is often used in the survey of street landscapes (Moriguchi et al., 2005: 89 - 101). Vertical green coverage is calculated using the presence of greenery in photographs. The method used is as follows (see figure 8):

- Photographs were taken along the street axis to simulate walking in a particular direction. A height of 1.5 m assumed as average height of human eyes.

- A Nikon D90 camera with a 28mm lens was used. According to Aoki (1975: 163 - 68), although the human field of view of approximately 60 degrees corresponds a photographic focal length of 28 to 35mm lens in 35mm format, for the study of vertical green coverage in the case of residential streets with characteristics similar to those of this study, the focal length of 28 mm showed the most accurate correlation between the real view on the site and the evaluation of photographs by residents.

- Shooting points were chosen to reflect the sequence of significant changes in the visual experience. Streets were photographed from five types of points: 1. Edge of street; 2. Curves; 3. Intersections (including the view toward perpendicular streets); 4. Points with width changes; and 5. Points with changes in the amount and distribution of greenery.

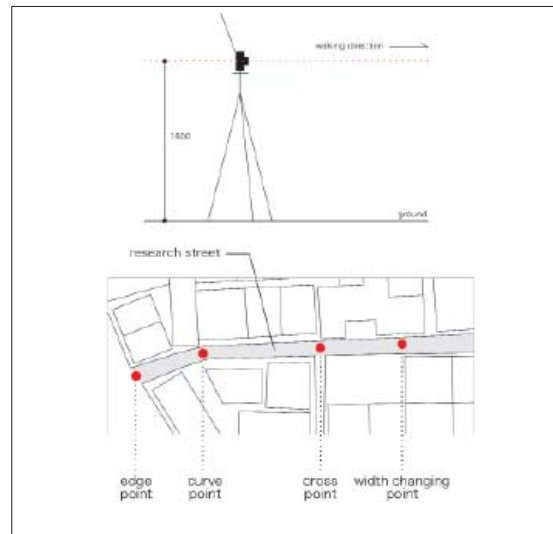


Figure 8: Photographic method for visual analysis and shooting spots (Source: Authors).

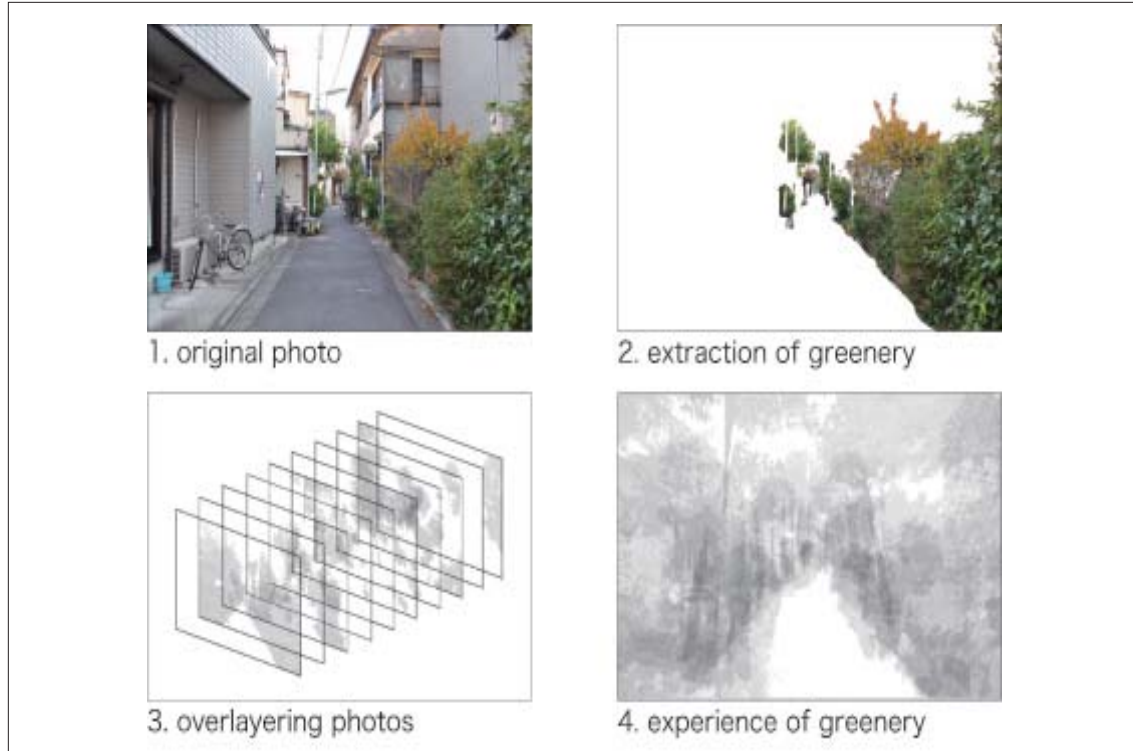


Figure 9: Extraction of greenery from photographic sequence and merging of vegetation layers (Source: Authors).

The second step was to extract the vegetation from photographs using Adobe Photoshop. Vegetation was classified and separated into image layers (following the same categories as in mapping - trees, bushes, pots, hedges, thickets, and low growth). To reproduce the sequential experience, the images were layered into a composite image and merged (see figure 9). Finally, the ratio of vertical green coverage was quantified from the number of pixels in each image.

### Visual Analysis Results

Results are summarized graphically in Figures 10 and 11. The amount of vertical greenery (expressed as percentage) showing total visual green rate and type of greenery has been summarized in Figures 12 and 13.

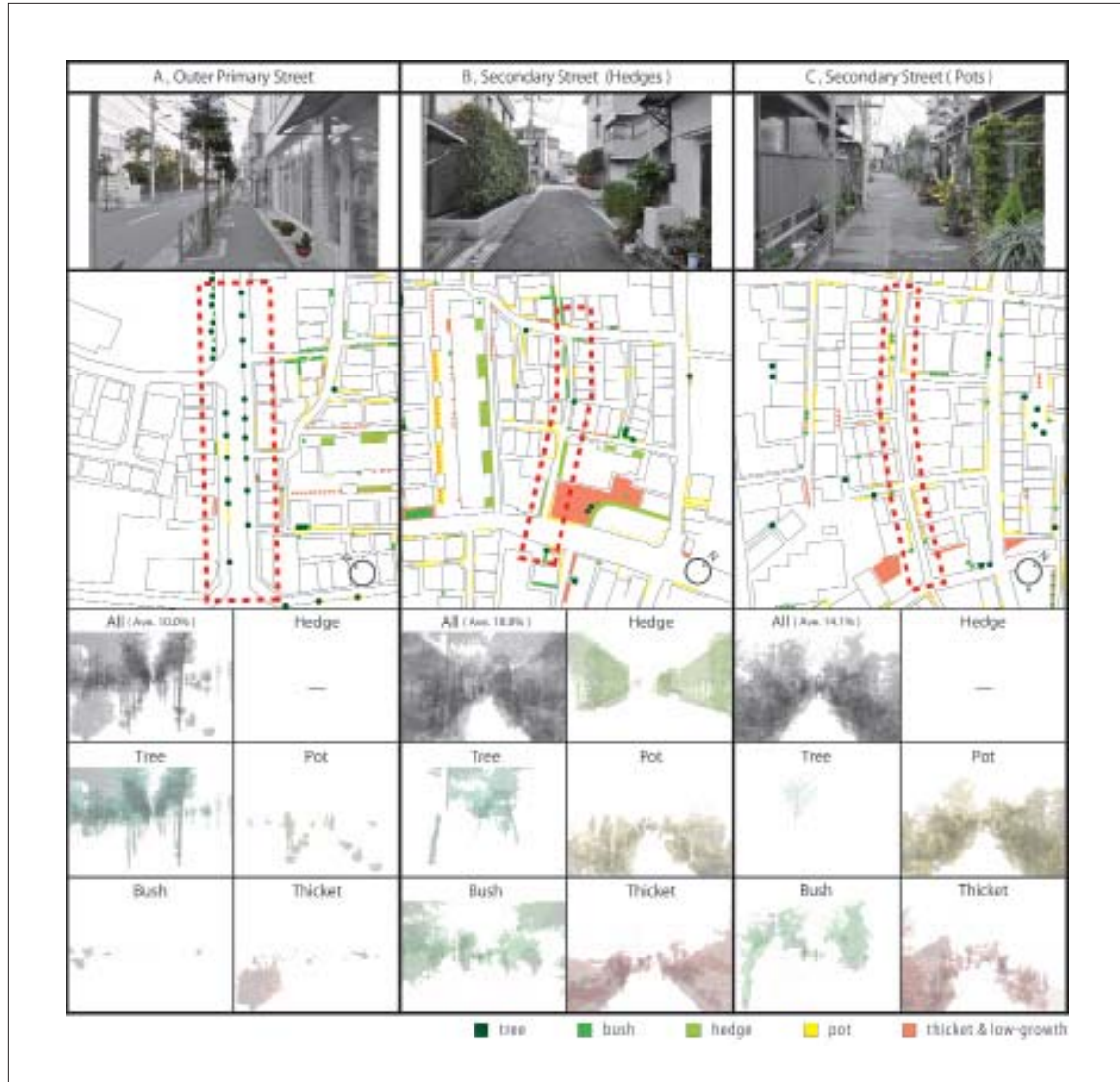


Figure 10: Graphic summary of the visual analysis of streets A, B, and C (Source: Authors).



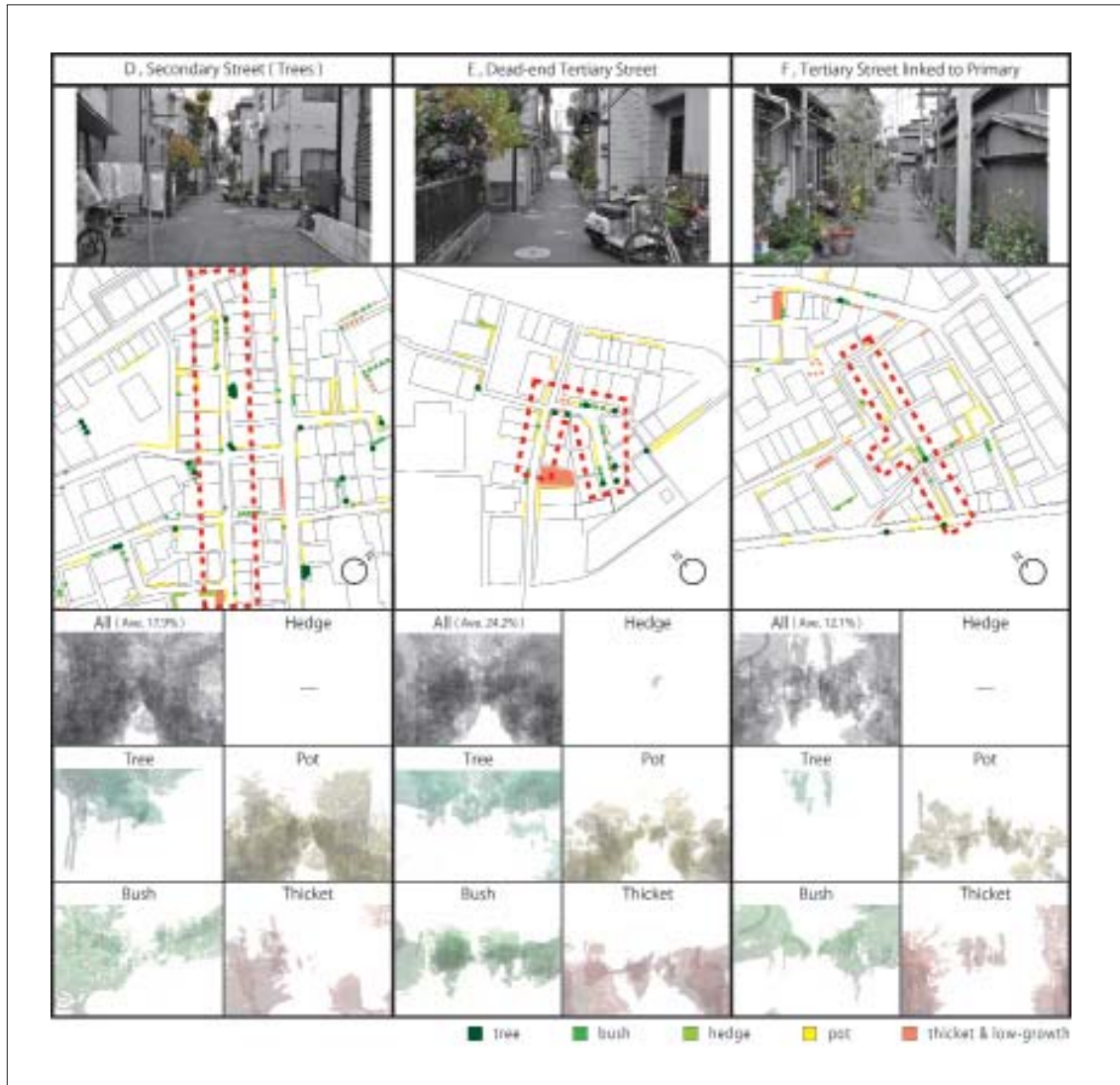


Figure 11: Graphic summary of the visual analysis of streets D, E, and F (Source: Authors).

Several characteristics concerning amount, type, and distribution of vertical greenery can be observed. Primary Street A (see figure 12) had the lowest average vertical green coverage (10.0%). Vegetation was composed of trees with high trunks placed regularly along the street. In summary, it can be said that this street offered low greenery placed in a homogeneous pattern non-intimately in relation to human vision.

In comparison, secondary streets B, C, and D show both a higher amount of vertical green coverage and more types of greenery (see figures 12 and

13). As seen in the merged image of all vegetation layers, visual density of greenery is closer to eye level and can be considered to have a more intimate relationship with pedestrians (see figures 10 and 11). Slight differences can be observed. Street B has a remarkable presence of hedges, which surround new buildings. Hedges contribute to vertical green coverage, but compared with planters, offer less varied scenery. The merged image of street C shows more density below eye level (pots and bushes), and in street D, the greenery extends above eye level due to the presence of trees.

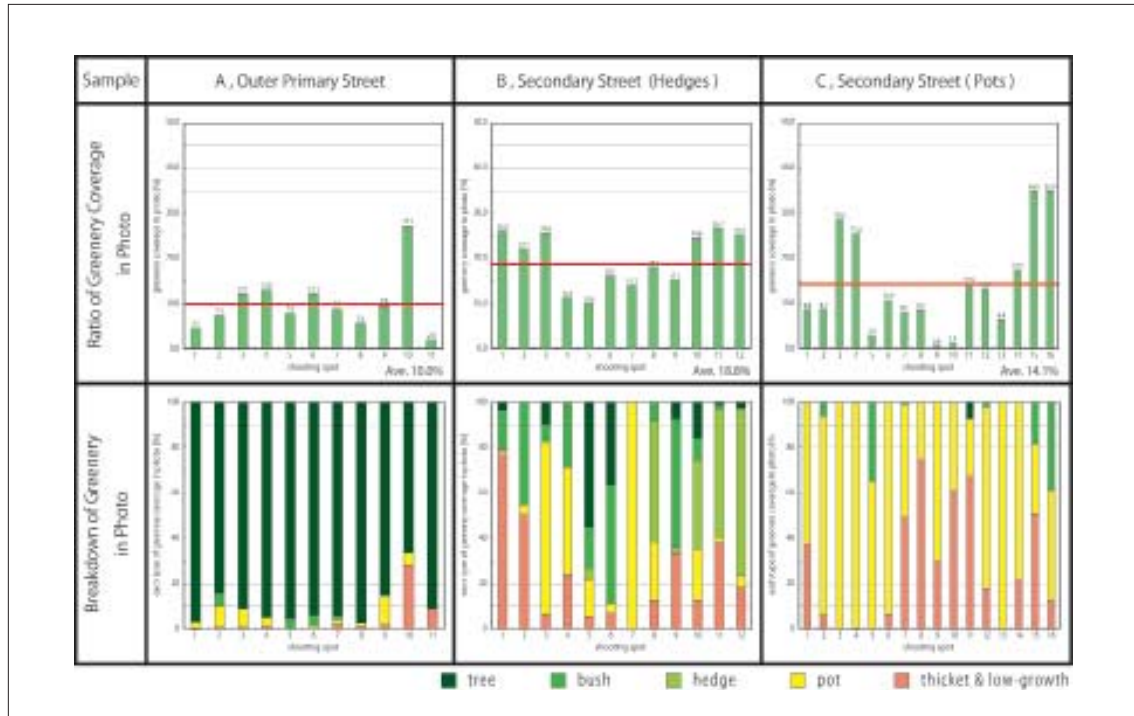


Figure 12: Percentage and type of vertical green coverage at each shooting spot in streets A, B, and C (Source: Authors).

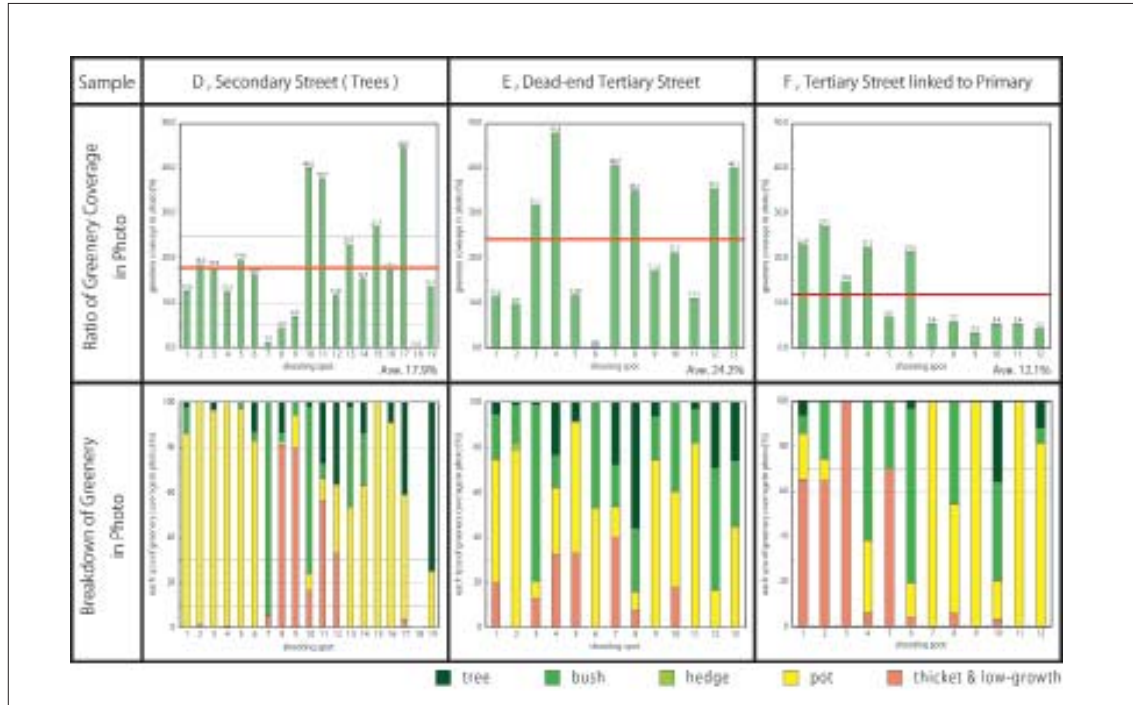


Figure 13: Percentage and type of vertical green coverage at each shooting spot in streets D, E, and F (Source: Authors).

Maps of tertiary streets showed a higher presence of greenery (See figure 13). Street E showed the highest vertical green coverage (24.2%) and variety of vegetation type. As for F selected for presenting less vegetation on the maps, it was confirmed that visual greenery was also scarce (12.1%), although its width of 1.2 m suggested an intimate atmosphere where residents could personalize the street. The authors observed that this lower amount of greenery might be related to the fact that it is linked with a primary street and that there are numerous pedestrians compared with other tertiary streets.

In sum, visual analysis of samples showed that the presence of greenery is high in the same streets where the map showed only small greenery - not even visible from aerial photographs. This can be explained by not only the narrowness of the street, but also the distribution: small vegetation on the floor is closer to eye level and can be perceived in a more intimate manner. In addition, diversity seemed to be an important factor: more diverse greenery contributes to enhancing its presence. In particular, planters seem to contribute to the experience of greenery in Kyōjima-Sanchōme. Their various densities, shapes, and colors, and

their placement close to eye level can be said to play a decisive role in creating a green visual environment.

### Discussions and Conclusion

Statistics show that there are few public green spaces in Tokyo compared with other world cities. However, plenty of small greenery can be seen in high-density low-rise residential areas. This paper maps this type of greenery in a case study area and analyzes the visual experience of several sample streets.

Mapping based on field work showed that the narrowness of the streets and the small individual houses incentivize personalization of the street space with pots. Small greenery does not occupy horizontal area and it is not reflected on aerial photographs but visual analysis shows that many narrow streets have a marked green character created by small vegetation placed spontaneously by residents. Spontaneity creates varied scenery, which contrasts with the homogeneity of tree-lined street and hedges around recently constructed apartment buildings. Judging from the distribution of greenery on the map and its visual experience, it is clear that small greenery plays the most important role in creating a general sense of greenery in Kyōjima-Sanchōme. This study shows that even in small spaces (such as the streets of the study area), a general quality of greenery can be created by promoting and supporting the individual practice of putting and caring for small private greenery such as pots and bushes in public streets.

The appearance of this type of greenery is an unplanned phenomenon that seemed to emerge as a delicate junction of factors, such as appropriate size of the street, appropriate amount

of pedestrians, density, and small housing type. This fragile balance can be broken easily. In fact, in recent years, in small urban renovation projects, the increase of pocket parks, the widening of streets and the construction of collective housing has been progressing in Kyōjima, and the small and diverse greenery has disappeared on many sites.

Desirable spatial practices could be reinforced by understanding the physical frame that supports them. Benefits from the practice of taking care of small gardens or planters seem to extend beyond visual and environmental factors; they also become social devices to personalize space, mark territory, and express the creativity of the residents in Kyōjima.

This study has many shortcomings for fully understanding the phenomenon and for developing useful concepts for designers to implement the desirable effects of spontaneous greenery. The focus is on the visual presence of greenery, but a more comprehensive approach will be needed in further studies to include vegetation species and measured environmental impact (e.g., cooling, smell, light, and shade). In addition, fieldwork, performed in November and December, needs to be extended to observe the flow of time and seasons.

In spite of the necessary further studies, this paper might contribute to shedding light on the importance of small greenery in times where cities throughout the world are embarking on plans to increase their green surface. Spontaneous greenscapes supported by small urban spaces and the residents' practice of space in everyday life can play a relevant role in social and environmental sustainability.

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## SPACE, COLOR AND QUALITY OF LIFE IN A NUBIAN ENVIRONMENT.

**Diana Kamel and Aleya Abdel-Hadi**

### Abstract

The Egyptian Nubians relocated after the construction of the High Dam South of Aswan to a completely different setting, adjusted with difficulty to their new environment and changed part of it to suit their needs. This paper is a longitudinal study; it deals with the issue of continuity in the patterns of lifestyle within the present Egyptian Nubian community. The aim is to seek evidence on such continuity and to explain the repercussions of previous socio-economic values on the actual residential built and lived-in environment. The methodology is based on earlier studies that were done before relocation and immediately after, also on site visits made by the authors to detect the current aspects of the built-environment. The field study focuses on changes made to the interior and exterior spaces, on the use of decorative patterns and color of the walls and on the residents' lifestyle. The tools for data gathering are annotated photographs and semi-structured interviews. The cases are chosen from a random sample in one of the 33 villages that constitute the Kom-Ombo site – the village of Eneba (Aniba). Results show evidence of change in all investigated aspects with a slight continuity in some of the culturally related values.

### Keywords

Patterns of lifestyle; Cultural authenticity; Residential built environment.

### Introduction

Over the past half-century, Egypt has undergone fundamental changes in its built environment. In the name of progress and modernization, an old and homogeneous urban culture has been replaced by patterns, which were borrowed from the industrialized countries of the West, thus leading to a totally alien environment (Christians et al. 1984: 408). Similarly, the Egyptian Nubians, 'a definable group', once described as a closed society, were relocated after the construction of the High Dam South of Aswan to a completely different environment. They adjusted with difficulty and made some changes to their new place.

The 'definable groups' who were once closed/tribal, relatively small, isolated and unacculturated societies: 'vulnerable ethnic minorities', are found in different parts of the world; the rainforest Indians of South America and the pygmies or bushmen of Central and South Africa. Other more heterogeneous tribal populations are the nomadic pastoral societies of the Sahel region, of the Eastern, and Western Africa, and the 'tribal' peoples of



India and Southeast Asia. These latter groups, which sometimes number in the hundreds of thousand or millions of peoples, are integrated into national and regional political economics, but still maintain a strong sense of ethnic identity and cultural separatedness. Some sources estimate that there are over 250 million tribal or indigenous peoples worldwide living in more than seventy countries (Burger, J. 1990: 18; Davis, S. 1993: 7-8). In this sense, as a 'definable group', the Nubians lived isolated from the Egyptian society and the common Egyptian way of life; in their lands, they did not benefit from civil services, such as the medical, educational and telecommunication services; they did not witness or live any change and/or advancement concerning their political and human rights as the majority of Egyptians did. The only Nubians integrated into the Egyptian population were those who went to the Egyptian cities for work. As such, the Nubian case raised a great interest to researchers on the psycho-socio-anthropological and architectural levels. The building of Egypt's High Dam in the 1960s erased innumerable historic treasures, but it also forever obliterated the ancient land of the Nubians. In 1963-64, they were removed 'en masse' from their traditional homelands in southern Egypt and resettled more to the North in the upper Egyptian areas (Fernea, R. and Gerster, G. 1973; Dafalla, H. 1975).

Much of the life of old Nubia revolved around ceremonialism, and in their remarkable study which has become a standard text in the fields of anthropology and cultural psychology, Robert A. Fernea and John G. Kennedy – anthropologists – together with Hussein M. Fahim, Armgard Grauer, Fadwa al-Guindi, Samiha al-Katsha, and Nawal al-Messiri

discussed some of the most important and distinctive aspects of Nubian culture in Nubian Ceremonial Life (Kennedy, J. 2005). Moreover, the Nubian unique architecture which closely reflected the lifestyle of its inhabitants was documented before submersion by travellers (Lane, E. W. 1830; published in 2000), the Egyptian State (MCNO 1960; MSA 1963), archeologists (Abu Bakr, A. 1963), architects (Fathy, H. 1964 & 1966), international painters (Roberts, D. 1856; Usick, P. 2002; Veillon, M. and Rodenberg, J. 2005); Egyptian painters such as Hussein Bikar, the brothers Adham and Seif Wanli, Tahia Halim and others in the 1960s and the "renowned Egyptian photographer Antoine Albert who documented Nubia and the Nubians in the different stages before, during and after relocation" (Attia, R. 2008 also see CULTNAT).

### Contextual Background

Nubia's geographic location: Nubia was an empire that extended along the Nile River from what is now Aswan in Egypt to present-day Khartoum in Sudan 2500 years ago. The Nubians of Egypt were settling south, along the Nile coast (350 km), between Aswan and Wadi-Halfa. That area of settlement is now submerged by Lake Nasser due to the High-Dam construction south of Aswan in 1956. The Egyptian Nubians have been relocated to the Kom-Ombo region in Upper Egypt, north of Aswan in 1964 within an area stretching sixty kilometers north-south (MSA, 1965).

Nubian life before relocation: Nubia has always depended for its existence on the Nile, and most people have always lived beside the river. Although the land along the river is very

fertile, the Nubian flood plain is much narrower than in the rest of Egypt, meaning that the land has always been less productive and the population has always been smaller. Because of its long cultural history, the folk heritage of Nubia is rich, varied and wonderfully original. It has distinctive features since it is the result of three mingled groups that make up the Nubian people: The Kenuz settled to the north close to Aswan, depended primarily on trade rather than agriculture due to their desert nomadic origin. Kenuzi homeowners had to adjust to a different topographical situation as they were forced progressively by Nile waters to move up their houses farther away from the flat plateaus on the bank to the stony hills near the mountain. Their homes appeared as row houses to utilise all available space. Executed entirely in mud brick, they used the barrel vault as a distinctive architectural feature. The Fedija Nubians, on the other hand lived more to the south up to Wadi-Halfa on the Nile banks where they cultivated the land and owned separate independent large houses with an almost square layout built around a large central rectangular open courtyard. Loggias and spacious one storey rooms surrounding the court were well designed for both winter and summer climates; and lastly, the tribe of Aliqat originally from Najd, moved to Nubia between the Kenuz and the Fedija, in the Wadi el-Arab region. "The houses in middle Nubia are little known, they seem not to have been greatly different from those in the northern and southern region" (Fernea, R. and Gerster, G. 1973: 51). Although the three tribes have different languages, yet they more or less intermingled by marriage. The Nubian community is a cooperative society: associations or (gama'iyyas) were and still are an important communal form to meet, take

drastic decisions concerning their community and give mutual help in cases of marriage, death or house construction. The Nubians have this motto: "one man cannot build a house, but ten men can easily build twenty houses". Nubian women too had a strong cooperative role with men in painting and decorating their house interiors.

Nubian Architecture: old Nubian's residential environment had characteristics that were closely related to the surrounding ancient Egyptian monuments. The Nubian houses were built of stone, clay and sand; the flat roofs were commonly built of palm leaves (jareed) and grain stalks and the arched domes were of clay bricks. The walls of the house especially the façade were decorated with ornaments and paintings of flags, flowers, birds and animals. Crockery was often used for wall decorations; a plate usually occupied the centre of the façade. The decoration of its exterior doorway, or (bawaba), was a mix of vivid colors and textures of adobe brick filigree, figurative and geometric images in mud, white lime-plaster relief, and wall-mounted objects like ceramic plates, automobile headlights, mirrors, cow horns and dried crocodiles. While the full range of these decorative materials has shrunk in recent years, the impulse to draw attention to one's home, and to its doorway as a symbol of the family, remains strong (El-Hakim, O. 1993:15-40). The old Nubian built-environment was a reflection of cultural authenticity: it was successfully responsive to users' needs (biological-physiological and cultural); its architectural forms fostered socialization among members of the community, achieved self-image and identity, it also realized privacy and thermal comfort.

Nubian life after relocation in the 1960s: from the previous studies which deal with the effect of the Nubians' relocation in new standardized prototypes, planned in rows, built for them by the Egyptian government, it was found and evidenced that they made important changes within their housing units which better suited their social needs. It is a well-known fact that wherever boundaries in a region increase in a strong and visible way, the more this community has a distinctive character and personality. If these boundaries are weakened, then the characteristics and personality of the place will vanish. The relocated groups have mingled with each other and with members of the Egyptian rural and urban society in the new areas; they receive all the appropriate services and have access to modern trends of living. This new exposure has caused a change of priorities among the newer generations of Nubians in relocation areas: they now favour oneself and their immediate family; their allegiance to the group has weakened (Fahim, H. 1975). The questions are:

- To what extent have those changes affected their built-environment nowadays in terms of space shape, size, relationships and furnishings?
- What are the wall treatments – color and decorative patterns – used indoor and in the exterior façade that are still reminiscent of the old values?
- What are the changes that occurred in their lifestyles?

### Purpose of the Study and Methodology

This study deals with the issue of continuity in the pattern of lifestyle within the present Egyptian Nubian community with the aim of seeking evidence on such continuity and to explain the repercussions of previous socio-economic

values on the actual residential built and lived-in environment. It is a longitudinal study; it draws from the related literature, the Nubians' lifestyle and their built environment before relocation (old Nubia) and soon after relocation in the 1960s. It is also based on site visits by the authors to detect the actual aspects of the built-environment. The field in-depth qualitative study, exploratory in nature is done on a random sample in one of the 33 villages that constitute the Kom-Ombo site: Eneba (Aniba). It focuses on changes that are obvious in both the exterior and interior spaces, on the use of patterns and color of the walls and on the residents' lifestyle. The tools used for data gathering are:

- Annotated photographs of the interior spaces of the actual visited residences, and the surrounding exterior space.
  - Semi-structured interviews with the residents enquire on the demographic characteristics, the duration of residency and the description of the residence. The interviews also focus on the level of present satisfaction with: the new location, the dwelling unit, and on the residents' future plans concerning renovation of their units.
- Data analysis depends on several factors:
- The tribal background (Fadija and Kenuz) as their old houses and habits are well documented in the related literature which helped in the longitudinal assessment.
  - The father's occupation: farmer, craftsman or laborers/ employee.
  - The family members' level of education.
  - The extent of exposure outside the local context.

### Space in the Nubian House

In old Nubia, social structure, people's economic condition, topography and climate were basic considerations in house designs.

Winter months in that area are quite cold with a steadily blowing north wind; hence, the living areas were placed to face south and west in order to receive as much sun as possible. On the other hand, because of the summer heat, which pours in from the south and west, the walls of the living areas were high, which created a shady patch close to the wall itself. For similar reasons, the roofed open areas in the courtyard located on the south or east-end were open to the north and west to allow access to late evening breeze; they offered an enduring living-and-sleeping area during the heat of the summer. "Houses varied in sizes, but were usually composed of a big walled courtyard with rooms built at the further ends of the yard. Near the main gate, a room was usually used for men guests locally known as Madyafa or Sabeel that opens on the outside by a terrace. The courtyard was the hub of all women activity where there were several big pottery or metal pots for storing flour and other cereals. Furthermore, within the courtyard, a sheltered area from the sun and wind functioned as the main living open area" (Riad, M and Abel-Rasoul, K. 2007: 38). Spaces inside the house were spacious; they accommodated few pieces of furniture that consisted of one or more beds Angarib used for sitting and sleeping purposes, wooden chests for storage and straw dishes used as trays for food during meals. The guest room walls were decorated with hand made straw dishes, decreasing in size patterns from top to bottom and with storage containers ornamented with shells hung from the ceiling.

Spaces in the Nubian house after relocation in the 1960s are smaller. They are repartitioned around one small courtyard and consist of two rooms only, a kitchen and a space for animals.

The bridal hall and the guest room which are typical of a Nubian house have been moved out. The row houses provided by the government are not responsive to climatic considerations, there is no good positioning of openings in accordance to orientation; the construction is in reinforced concrete which resulted into thermal uncomfortable and to acoustical infringement on privacy. The post occupancy evaluation done in the 1980s and 90s by several researchers on the relocation houses in Kom Ombo reveals that they restructured their new housing units and the adjacent exterior spaces to provide more privacy, more space for social hospitality and to host the different rituals that express their strong cultural allegiance; they also redecorated and colored the empty new façades in their old style (see Figure 1); (Atalla, H. 1981; Fahim, H. 1981; El-Hakim, O. 1993).

The results of the semi-structured interview done by the authors of this paper on Eneba (Aniba)'s residents reveal similar house renovations to what has been documented some twenty years ago in terms of spaces also of type and way of furnishing. It shows the extent of residents' dissatisfaction of their houses even after the renovations they made. It is noteworthy to add that the result of the answers on the demographic characteristics of the chosen sample show that the sample is formed of a combination of both Fedija and Kenuz tribes (see Chart 1).

Chart 1, illustrates that 100% surveyed Kenuz residents renovated their new house, on the other hand, 88% of Fedija made the same renovation. Furthermore, 40% of Kenuz and 48% of Fedija were completely dissatisfied with their housing units even after renovation.

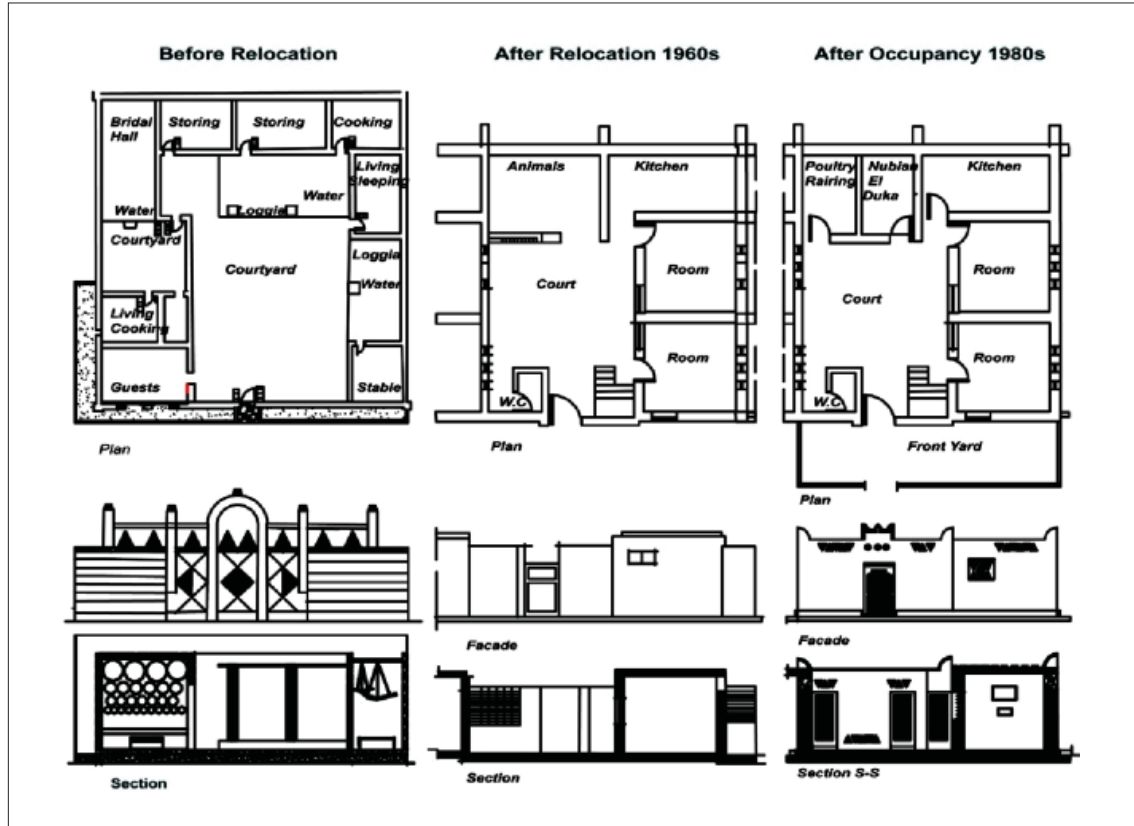


Figure 1: The three stages of the Nubian House: old nubian house, prototype for relocation, prototype restructured after occupancy. (Source: Authors).

### Current changes as observed in Eneba 2007:

The semi-structured interviews and photographs which are taken on-site evidence several renovations. The most common renovated elements collected by the authors are:

- Constructing an outside yard surrounded with a wall fence.

- Constructing a built-in level outside the façade or (mastaba) for men gatherings.

- Dividing animals room into two small rooms, one for poultry and the other for storage.

- Closing the large windows and constructing narrow clerestory ones.

- Decorating façades and interior courtyard walls.

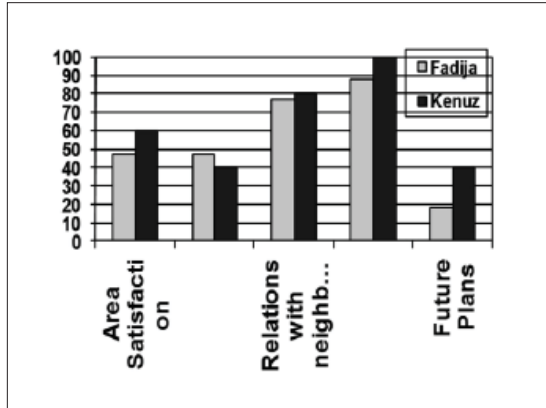


Chart 1: Eneba's Residents' Satisfaction. (Source: Fadlaja and Kenuz).

- Changing the color of interior and exterior wall-painting.

### Continuity Evidenced in the Façades of the New Settlements

Entrances after renovation are highlighted with pillars, they still remain a vital and dominant elements on façades. The changes that have been done refer to the old Nubian architecture, while the full range of the old decorative materials has shrunk in recent years, the impulse to draw attention to one's home, and to its doorway as a symbol of the family yet remains strong. The "chicken-and-shrub" design in the old Nubian façade (see Figure 2), becomes a friezes that defines the bottom of a band of decoration that goes all around the house (see Figure 3 - Eneba village in 2007) (Werner L. 2006).

Interior Design in the old Nubian style show wall-patterns organized by covering the entire walls with hand maid straw dishes, especially



Figure 2: Entrance Highlight – Pillars in Old Nubia. (Source: Fernea, 1966).

the guest room which is called Madyafa as represented in the following sketch (see Fig. 4); those dishes decrease in size from top to bottom.

### Continuity Evidenced in the Interiors of the New Settlements

The habit of hanging straw baskets and clay containers still prevails, whereas dishes in the present houses have almost disappeared; they are mostly substituted by decorated framed pictures on the walls. Nonetheless, we can see them concurrently ordered in the same old rhythm: from top to bottom, decreasing in size (see Figures 5 & 6: Eneba village, 2007).

### Color in the Nubian House

The exterior color scheme in the old Nubian houses as was shown in several documents and available photos, and in reference to what is illustrated in the previous section on old Nubian



Figure 3: A current façade in Eneba 2007. (Source: Authors).



Figure 5: Hanging Straw baskets. (Source: Authors).

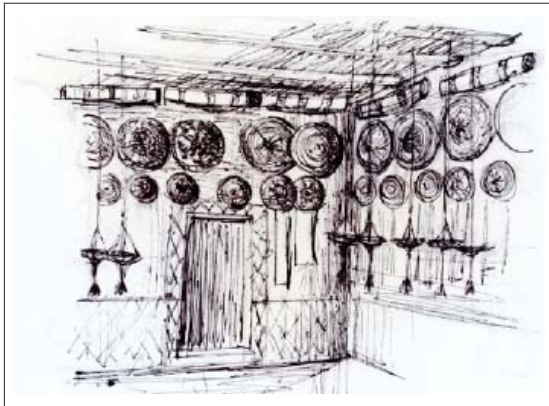


Figure 4: Interior of a Madyafa. (Source: Diana Kamel).



Figure 6: Interior walls patterns (Source: Authors).

façade (see Figure 2), reveals an earthy color scheme varying between yellow, brown, dark-brown, white and yellow-grey. In this case, the scheme can be described as having saturation contrast. "The nuance of saturation contrast does not distract the eye from characteristic details, but tends to enhance them. Contrasts in saturation add interest without deformation

of form" (Kopacz J. 2003: 45-55).

In the present exterior color scheme, the observation in the field plus the results of the structured interview done by the authors on Eneba (Aniba)'s residents show disappearance of the exterior multi-color paints. Moreover, it displays their new color scheme (see Chart 2),

which is very limited compared to the old one.

In Chart 2, (44%) of Fadija and (60%) of Kenuz use yellow as their exterior color scheme, whilst (22%) of Fadija illustrate green, and (20%) of Kenuz prefer blue and red, for their house exterior. Some other colors have been mentioned in small percentages such as grey and white. However, evidence shows the dominant use of yellow in façades (Eneba, 2007).

The interior color scheme in the old Nubian houses exhibits a cheerful and delightful decoration which spreads from the portals to the walls and into the interior, especially the women's quarters. Here on the mudwall, "one finds painted and plastered ships, fish, scorpions, birds, camels, date palms, and flowers; suns, moons, and stars; crocodiles and lions, mosques and prayer carpets" (Gerster, 1963).

In the present interior color scheme, the results of the structured interview done by the authors with Eneba (Aniba)'s residents demonstrates the interior color scheme (Chart 3):

In chart 3, peak points of Fadija and Kenuz are (38 %) and (40%) demonstrating blue for their

interior color scheme; whilst white, red and beige equally represent (20%) for Kenuz. On the other hand, white, red, green and beige are observed to be less than (10%) for Fadija. There is evidence however that the use of soft and light blue in interiors is dominant in the two sub-cultures. "Cool, de-saturated and light colors are considered to increase the experienced spaciousness" (Nemcsics, 1993); thus, the color selection in current Nubian interiors helps increasing the feeling of spaciousness in their limited spaces.

### Continuity Evidenced in the Use of Color in the New Settlements

Color is an exceptionally true interpreter of people's tendencies to self or group mood. The abundance in using yellow in exteriors is apparent in the two sub-cultures (Fadija and Kenuz). Yellow maintains a reputation as the happy hue. It is an inspiring color, considered to be warm and joyful, radiant, cheerful, and approachable, generating a positive impact on its witness. People identify yellow as the color representing hope, wisdom, optimism, spiritual enlightenment and mental well-being (Kopacz, 2003: 78). It is a successful interpreter

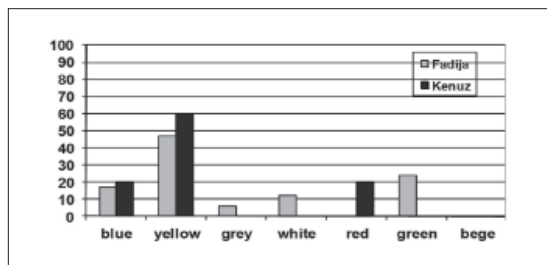


Chart 2: Eneba village: exterior color scheme of Fadija and Kenuz (Source: Authors).

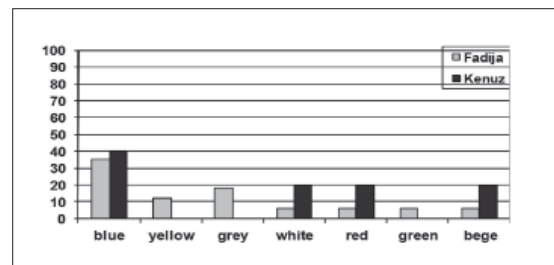


Chart 3: Eneba village: interior color scheme of Fadija and Kenuz (Source: Authors).



of self-image and identity for the Nubians who are ceremonial people; they always strive for uniqueness and still give an attractive and approachable color to their houses. Light and soft blue on the other hand is mostly used in interiors; it is the color of a clear sky, a symbol of optimism and better opportunities (Sloane, 1989); it also creates an atmosphere of peace and serenity, and most of all, it is insects repellent. Therefore, the use of yellow and the concept of dividing the external façades into horizontal areas remains an evidence of continuity. Conversely, the mud color of the old interiors decorated with wall hangings or painted in bright colored motifs are currently replaced by a plain light color mostly blue.

### The Nubians' Style of Life-Some Continuity

As mentioned before, old Nubians have long standing traditions; men conversing outdoors, a habit maintained in the new houses by building Mastabas near front doors; also interior furniture is quite similar to the old one and represents continuity even from ancient times (see figure 7 & 8). Nonetheless, change is also quite discernible in their current physical and social

surroundings; data analysis reveals that the age of households' heads mostly ranges from forty to more than sixty, when age is correlated with education; the younger are the more educated.

Occupation changing from laborers and/or land cultivators to professionals correlates to heads of households' education level; few of them are university graduates. However, in this longitudinal study, the argument is not how to avoid change, but how this change is accepted and survived, not only in the physical sense, but also in terms of self-respect, of personal worth, group identity and peaceful cooperation with one's fellowman that makes life worthwhile for the individual. As we have proven in Chart 1, only (22%) of Fadija and (20%) of Kenuz have been able to apply some of their cultural heritage, it means that almost (80%) cannot apply it. Their relocation shows some acculturation as they have somewhat -in the third generation- acquired new habits from the local saeedi pattern of lifestyle and some of the less elaborative features that are reminiscent of the new local architecture of

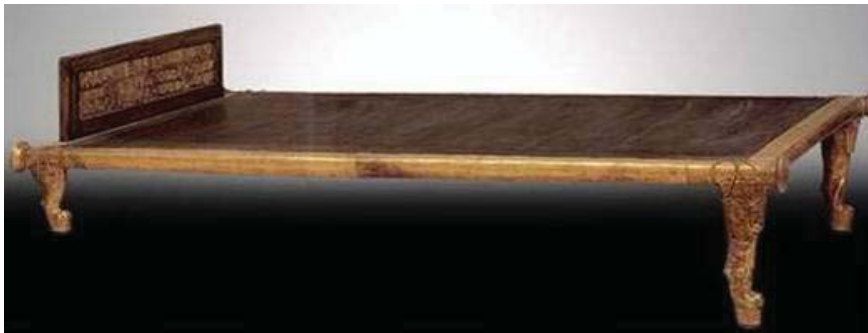


Figure 7: Ancient Egyptian Bed. (Source: NA).



Figure 8: Nubian Bed - Angarib. (Source: Authors)

the Kom-Ombo region. Although they tried to renovate some elements, yet (50%) of Fadija and (40%) of Kenuz are not satisfied with their new residences, they are still dreaming of their old houses; likewise, (18%) of Fadija and (40%) of Kenuz have no future plans for more renovation in their present houses. Selected comments such as: "we prefer to live on the Nile banks - there, we had a regular income from our own palm manufacture, here we are merely employees - there, we had our own inherited agricultural land, here we do not even possess one (qirat) - here there is a high percentage of unemployment"; such comments explain the main reasons that are behind their ongoing will to go back to the old premise which now is the place around Lake Nasser in order to regain their independent and unique identity.

## Conclusion

The Nubians are mindset about their heritage; in old Nubia, social solidarity is one of the important principles of their life style, they share and cooperate in funerals and weddings. Their cooperation is a social phase; it strengthens the

bonds of brotherhood and love; it revives in the hearts of everyone the feeling of reassurance to one another (Metwally, 1990: 22). As they are deeply concerned about the possible loss of Nubian culture and cohesion, they formed groups to rejuvenate the arts of the Nubian past in painting, in writing poetry and in composing music and singing. They took from the new situation only what they need and want and rejected elements that do not correspond to their inherited values. The key success to continuity in the Nubian society is partly due to the Egyptian society which has made many alien minorities a part of itself throughout its long history. It also rests upon the nature of the Nubians themselves, their high adaptability and adjustment to new situations and at the same time, retaining those values that have always shaped their uniqueness. The Nubians' ongoing constant communal activities through their social clubs Gama'iyas play a key role in their struggle for upgrading their villages and their upward mobility in the labor and the professional market. It also helped them have constant dialogues until to date with the authorities to go around Lake Nasser and settle there.

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## NIZAMS: THE HIDDEN SYNTAX UNDER THE SURFACE. *URBAN MORPHOLOGY IN TRADITIONAL ISLAMIC CITIES.*

Somaiyeh Falahat

### Abstract

The reasons behind the urban form of traditional 'Islamic cities' are still disputable themes among authors. As a step forward, the city should be observed by taking into consideration the indigenous structures and concepts. This article, after reviewing the earlier ideas and efforts in this regard, suggests that the city is the result of interaction of various Niams and the major reason underlying the urban morphology is the simultaneous presence of these Niams and the fact that their hierarchy of importance was flat and horizontal. It defines the Nizams as interlinked frameworks including various dimensions which make the syntax of the city's order.

### Keywords

Urban Morphology; Traditional Islamic cities; Nizam.

### Introduction

One of the exclusive characteristics of traditional 'Islamic cities' is their traditional urban form, and this has often attracted the attention of non-native travellers and scholars. For the European scholars, mainly French Orientalists, who developed the first body of scientific studies and theorizations about the urban affairs of traditional 'Islamic cities' in the early 20th century,

they described the morphology of these cities as an exclusive feature, which together with their distinctive urban elements - such as the mosque, bazaar, and Hammam - differentiates them from other cities of the world. Comparing these cities with Roman ones, taking the latter as the ideal model against which they should be measured (and highlighting their differences from it), these scholars understood the morphology of traditional 'Islamic cities' by negating their character and particularity, rather than presenting their exclusivities.

Revisionist authors of the 1960s who began to address the deficiencies in the Orientalists' ideas, trying to give consideration to the social context of the cities in their investigations, nevertheless to some extent followed the same approach. Despite their efforts, the Orientalists' attitudes towards observing urban form remained almost unchanged, so that, in later observations too, the traditional 'Islamic cities'' urban shape was understood as an unusual or abnormal form. This time the authors did not explicitly articulate this position, but their justifications and attempts at finding the reasons behind the urban form, betray their perspectives. Although their

arguments considered the contexts and did not foreground perceived deficiencies, they had repeated recourse to comparisons with Max Weber's theories, with European cities, or with the European meaning of public life and space. In recent arguments, which one can refer to as the third phase of urban studies on traditional 'Islamic cities', the distance from the French authors' theories becomes more drastic. The authors in this phase not only fundamentally criticise the French Orientalists' ideas, they also open new aspects of understanding the different dimensions of the form of the city by proposing specific approaches.

An essential question — either hidden or obvious — behind all these observations has been: why does the traditional 'Islamic cities' urban form look the way it does, a question to which the authors propose various explanations according to their distinctive perspectives. While a group of scholars evaluated this particular urban form as a negative feature derived from the lack of urban structures — social, administrative, and religious — another group attempted to find the answer by observing cities in their context and not necessarily relating negative characteristics to them. Despite these endeavours and explanations, a general framework or theory for the reason behind this particular form is still absent. Many of the explanations are applicable but do not encompass all the influential factors and do not explain the variety of urban forms in different cities of the region. In other words, these elucidations might be true by themselves, but they are not by any means sufficient. Therefore, to achieve a more comprehensive explanation it is necessary to revisit this essential question. For that reason, this article first highlights the main gap in understanding and analyzing the morphology of the traditional 'Islamic cities' by reviewing

the ideas which have attempted to clarify the reasons behind the form these cities take, and then provides a new approach to question the urban form in traditional 'Islamic cities' by grasping autochthonous concepts and structures (Nizams).

### Precedent Arguments

In earlier arguments on the urban morphology of traditional 'Islamic cities', authors mostly argued that the urban form is the result of the direct impact of either one factor or a collection of factors as these impinge upon the city. These factors include a range of issues such as climate and the absence of wheeled vehicles, the lack of administrative or municipal organizations, the need for privacy, the lack of a defined status in Islamic law for cities, the lack of protection for the existing streets against the encroachment of private residences, and the impact of Islam. These explanations indicate that there are some dominant elements in the city which shape it and these are the main reasons underlying its form. That means the city gained its shape because those special factors have imposed their rules in the city.

There is a general consensus among authors about the influential factors in traditional 'Islamic cities', despite the high variety in the explanations that have emerged since the first decades of the 20th century. Generally it can be said that all of them circle around a distinct number of main common topics: for instance, climate, irrigation systems, security and resilience, absence of wheeled vehicles, socio-political and economic factors - including socio-cultural conventions and privacy — religion; and historic backgrounds. For example, climate is introduced by Hassan Fathy (1986) as the main determinant of urban form. He believes the form of the streets is the result

of the climate, and that the arid climate of the region necessitates this kind of pattern. On the other hand, the irrigation system and topography are mentioned by Michael E. Bonine (1979) as another form-generating aspect. He argues that the form of the street network in Iranian cities was developed due to the irrigation systems, whose orthogonal network of water channels corresponds to the slope of the land and determining the walkways.

However, there is a high level of disagreement about the ways these influential factors affect the city. For instance Paul Ward English, Besim Hakim, and Janet Abu-Lughod all consider religion as the main formative factor. For his part, Paul Ward English (1966) believes that religion has resulted in a decrease in political and civic interest in the city, which has led to a lack of city planning organizations, and segregation within neighbourhoods. By contrast, Besim Hakim (1986) believes there are particular building codes which guide city-making and shape the geometry of the urban form. Nevertheless, the differences between Muslim and Hindu quarters convince Janet Abu Lughod (1987) that Islam shapes the urban form of Islamic cities, by such means as making juridical distinctions among different classes of the population, on the basis of their relationship to the Umma, by encouraging gender segregation which leads to the creation of spatial imperatives, and by its definition of the property system.

Similarly, the socio-cultural structure and its sub-factors attract the attention of another group of scholars. For example Jamal Akbar (1988) highlights the question of responsibility and categorizes the forms of responsibility for property into six types, each one being the product of

three main factors of: ownership, control, and use. He believes this particular issue of responsibility is the main shaper of the layout of Islamic towns. With a different approach, Spiro Kostof (1991: 63) claims that the urban process which shapes the urban form in Islamic cities depends on "implicit conventions informally established and observed," certainly, "written building codes of local currency," and "religious law."

In a different way, some authors point to the background or primary prototypes of the cities as the factors which have influenced their form and defined the way they grew. Eugen Wirth (1975) proposes that the features of tree-lined routes and cul-de-sac in these cities are rooted mainly by Mesopotamian principles.

Some other authors propose different explanations which are not focused only on the above factors. For example Nader Ardalan et al. (1973) seek the origin of the form of the city in the mystical religious philosophy of gnosis, while Nazar Alsayyad (1991) focuses on the role played by the caliphs in shaping the urban form of early Arab urban settings and subsequently the model of the 'Arab Muslim City'. Masoud Kheirabadi (1991) points generally to the urban factors that have been influential on the form of the city.

### The Necessity of a New Approach

All these explanations and theories elucidate one or some influential aspects of the urban form and subsequently clarify a dark corner of the whole. Studying the historic evolution of cities reveals that not only was religion important and omnipresent but the climate was also a significant influence, due to the rough desert climate. Similarly, the prevailing social structures

were in direct inter-relation with people's way of life, so they also defined the urban form in many regards. Additionally, many other micro-factors emerged according to the historical, cultural, and social background of the city and its special conditions - for instance, whether it is a capital city or a commercial one, or has a village origin, and so on.

All of these factors - macro and micro - were woven to the life of people, affecting the way they built their cities. These elements construct a whole whose internal interactions generate the final form of the city over time. The manner and degree of each factor contributes to the distinctive formation of each city, and the final forms of cities are always different, although they have generally similarities and have been grouped into one category.

Moreover, it can be said that the whole stream of research goes in one direction and it seeks to understand the order of traditional 'Islamic cities' and the reason behind it by employing would-be universal— not local— analysis methods, norms, approaches, and definitions; and supposing a meaning and structure for order in its global sense. But it seems that merely latching onto these methods, which originated from and were based in other contexts and places, mainly western one, cannot furnish a proper basis on which to understand cities — as the still-ongoing disputes and incompatibilities between scholars' accounts may testify.

Obviously, what is needed is a change in approach, considering the indigenous context not only in order to discover the factors of significance, but also as a way of understanding and reading the city, which can also explain

why cities have gained this special geometry. Understanding the difference between traditional 'Islamic cities' and other cities, as well as the exclusivity of each group of cities, necessitates applying a new kind of view, which is more appropriate and compatible with the indigenous context and originates from concepts that belong to the life-world of the people. This new way of understanding the city reveals that the cities can have another kind of urban geometry which is not known in international standard discourses introduce a new urban order, and opens a general framework in which the impact of influential factors on the form of the city can be studied in a more comprehensive way.

### **Towards a New Framework: Nazm and Nizam**

Climate, geography, water, religion, society, and many other elements, seem to constitute the basic influential factors in the formation of the cities all over the world across the ages. These elements impact the cities distinctly in different contexts according to the way they are related to the life-world of the people.

In the context of traditional 'Islamic cities', these elements are so interconnected and interwoven with the citizens' life-world that they generate a particular character. Due to this multiplicity, such factors are not treated any more as individual influential elements but expand a vast framework of tangled relations within the city. This complex framework determines how the city might embrace such elements and interact with them. For instance, the role of water in shaping the city is not merely limited to its ecological importance and its one-dimensional, physical presence, but encompasses its special association and meaning in religion and religious-philosophy



(the latter entailing Hikmat and sacredness). This fact changed it from a normal, important ecological element into a very special and cherished element in the city. Each of these areas — environment, religion, and philosophy — define the importance, function, and application of water in its exclusive mode, which together determine how it is ordered and the way the city has to embrace water, use it, and interact with it. Physically and environmentally, the cities of the region have mostly a hot dry climate; on the other hand, water has always been appreciated as a very important element that increases humidity, improves microclimates, tempers the heat of summer days, and thereby promotes thermal comfort in hot arid lands (Fathy, 1986). So, water has been physically important, not only because it is an ecological element which is valued in all cities, but also because its scarcity has transformed it into something that represents more than just a normal, prerequisite, factor in a city (Habibi, 2006; Sultanzade, 2001; Gaube, 1979; Gulick, 1974). Spiritually, from the religious point of view, water is necessary for many ceremonies and ritual purifications - such as ablution for daily prayer.

From a philosophical-religious (Hikmat) point of view, water was understood to be one of the main elements of the world of imagination (alam-i-misal) which, in Islamic cosmology, stands in an intermediate region in the hierarchy of cosmic existence, between the material and purely spiritual worlds (Ahari, 2007). As Nasr (1980: 2) argues "Its forms, sounds and colours have an objective reality, and its ontological reality serves to give human imagination a function above and beyond profane imagination as understood in the modern world." Furthermore, the image of paradise is always represented in connection with

water, in the way that water is an element present in all of the scenes describing paradise in the Quran. So, from a philosophical religious point of view, water is a limpid and sacred element belonging to alam-i-misal whose limpidity can reflect infinity, paradise, purity and so on. As Bianca (2000: 66) declares, alongside other architectural elements, water has a "contemplative" status, and is an element through which man's mind, according to Islamic philosophy, is enabled "to open a window into the realm of timeless existence."

Therefore, water is connected to the life-world of the residents in a multifarious way and must fulfil various functions in the city. This means that water constitutes a framework with tangled relations in the city, through which the city reads and uses it. These define how water should be available for the city and its buildings; and how the buildings, Mahallas, and routes should be formed to meet the city's needs for water.

We can better explain this framework and relations by grasping an informative terminology: Nizam. Nizam is cognate word of Nazm. Nazm means regular order and is manifested in regular, geometric patterns, such as characterise Islamic ornamentation, while Nizam connotes another kind of hidden order that is not necessarily a regular, geometric pattern. In fact, Nazm has a Nizam but Nizam does not necessarily present a Nazm. Nizam points to a hidden framework, according to which the elements of a complex are connected to each other. It has a sense of logic, but not necessarily a clearly determined regular order on the surface (see Figure 1).

Each essential factor enters into the framework of the city in the form of a Nizam which is, in fact, the framework determined by that factor's

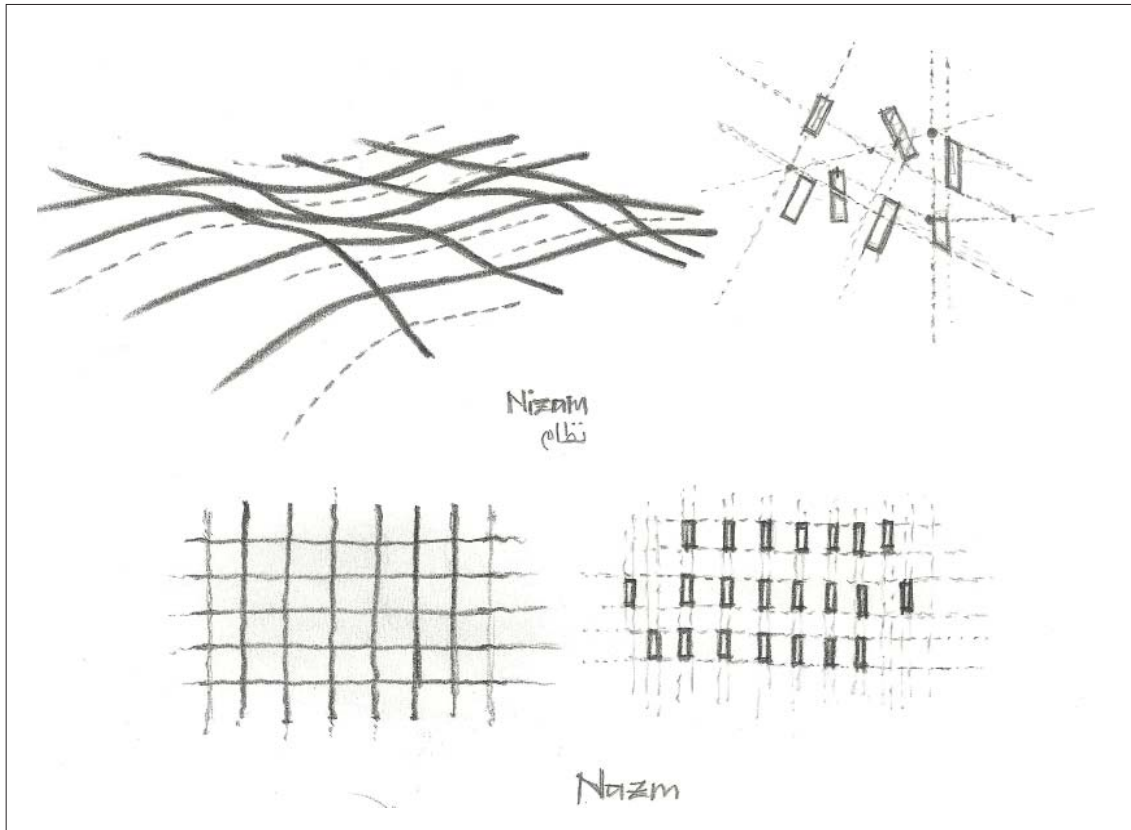


Figure 1: Abstract representation of Nazm and Nizam. (Source: Author)

multiple relationship to the autochthonous life-world. Nizam is the direct result of people's mental structures and presuppositions imposing their rules into the city — structural rules or formal ones — and the manifestation of the presence of the factor at all layers. Each layer imposes its order into the morphology of the city. The Nizams are treated as matrices.

Clearly, there are numerous Nizams shaping the form of the city, ranging from the most obvious to the most concealed and a similar discussion can be held for other Nizams existing in the city, such as trade, socio-cultural structures, religion and political structures.

## Form of the City as the Result of the Simultaneous Presence of Nizams

The city is the outcome of the interaction of Nizams; the simultaneous presence of all Nizams at –almost – the same level of importance – and not the dominance of just one or two of them. This means that the city not only has to smooth the operations of trade and commerce, but must also provide a base for the religion, respect cultural values such as privacy, the segregation of different ethnicities and professions, and so on, while nevertheless embracing them, but at the same time respond to climatic and ecological issues, which because of heat and aridity necessitates special solutions. The city divides land up according to the tenets of Islam, to keep the members of a clan or religion or family together, tempers the unbearable heat and aridity of the climate, brings water to the arid city, and so on, all simultaneously; what has been discussed in other texts too. So all the Nizams contribute to the building of the city and none of them is so dominant that it overshadows the others and dictates its framework to the whole city and the other Nizams: this may be the distinct and exclusive feature of the cities of the region.

Therefore, the city we encounter is one whose geometry is the product of the superimposed, physical manifestations of the interwoven and (almost) equivalently important Nizams. If we suppose the framework of each Nizam, very simply, and without considering its meaning and any historical and dimensional complexities, as a net (or matrix), we will have a number of nets which are laid over each other and constitute the form and order and syntax of the city (see figure 2). What is important in this composition is that even if we reduce each of these Nizams to a simple network, the combination of these

networks seen from above gives us a seemingly chaotic geometry, because there are many orders within it, without any dominant framework that dictates and shapes other orders according to its framework. So, for example, what makes the Old City of Safavid Isfahan different is mainly the simultaneous presence of all the Nizams in the city, without any highly dominant Nizam. The multiplicities of interwoven Nizams, which have grown in time, along with their internal relationships, undoubtedly make this composition more complex.

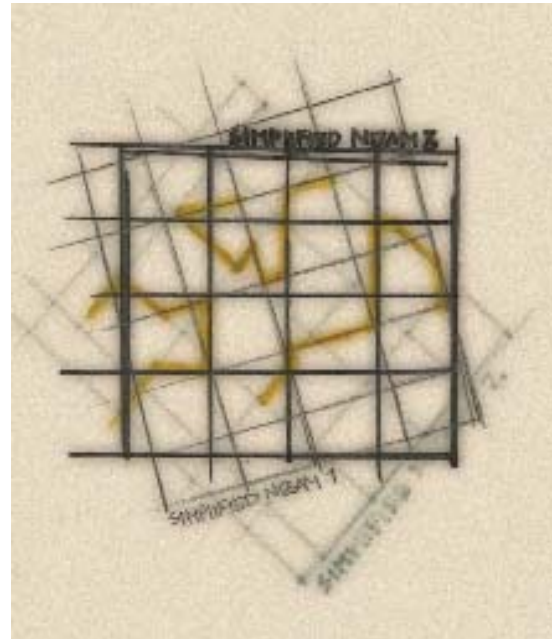


Figure 2: Abstract representation of the syntax of the city. (Source: Author).

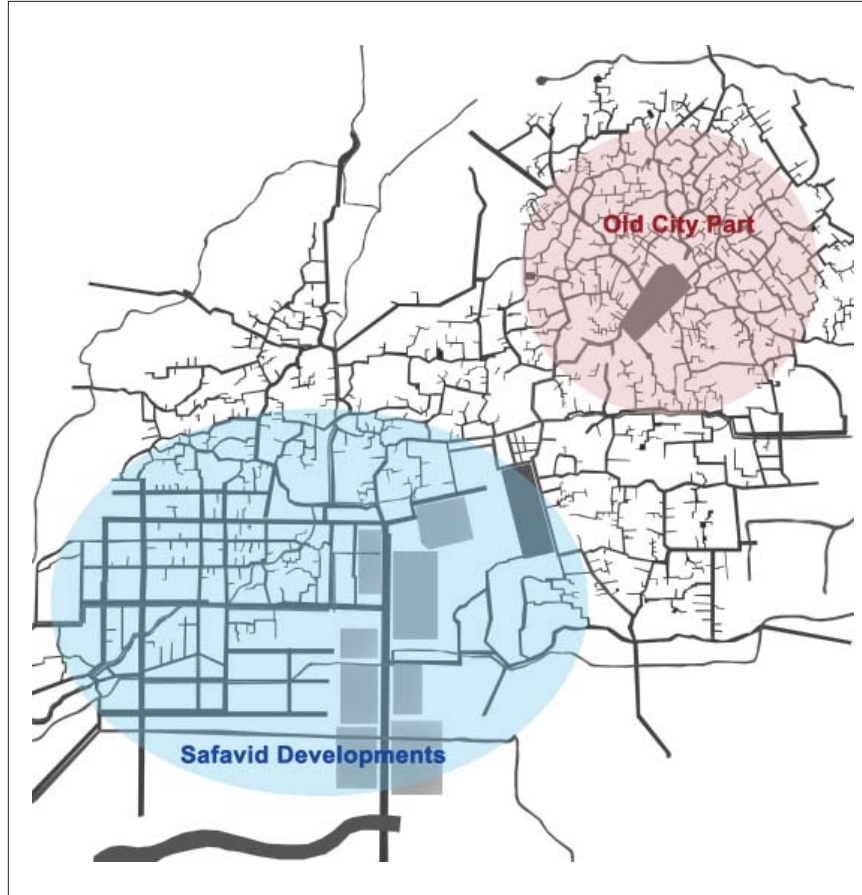


Figure 3: Street network of Isfahan in Safavid period. Two cores of the city are clear in the map. The north eastern part belongs to Old City and the south western part to the New City, namely Safavid one; (Source: based on Seyyed-Reza-Khan map).

The twofold geometry of Safavid Isfahan might be the best illustration of this claim (see figure 3). In the (pre-Safavid) Old City of Isfahan - the Seljuqid city - where the city was built incrementally by the people, there were some principles and Nizams in the city whose hierarchy of importance was flat and horizontal; although in some periods,

according to circumstances, one of the Nizams acquired less or more importance, there was always a general balance so that none of the Nizams dominated in a determining and decisive way. This superimposition of Nizams, as well as their simultaneous presence, created a non-geometric form for this part of the city.

In high contrast to this, in the Safavid period, the ideas and orders of the Shah stood at the top of the hierarchy and became overwhelmingly dominant, so that a framework was defined, into which most of other vital elements of the city - such as water, society, religion and so on - were inserted. The result is a relatively geometric order in which the hierarchy of Mahallas, the water canals, the commercial routes, and the religious buildings were shaped or appointed according to a dictated order; a superior order.

The superior order which dictates its rules - should not necessarily originate from a geometric order; it can also be the order of nature, which leads to an organic pattern. The important issue is whether or not there exists an above-order, to dictate its logic onto the city.

In sum, in the case of the Old City of Isfahan and most of the traditional 'Islamic cities', there is not any above-order. The Niams in these cities interact with each other and their simultaneous presence forms the shape of the city and contributes a kind of complexity to it. This simultaneity is the main reason for the particular morphology of such cities, which makes reading their form difficult and challenging. This factor can also explain differences between the geometries in the cities within the general category of traditional 'Islamic cities'. The way in which the Niams are ordered within a hierarchy is the main determinant of this difference.

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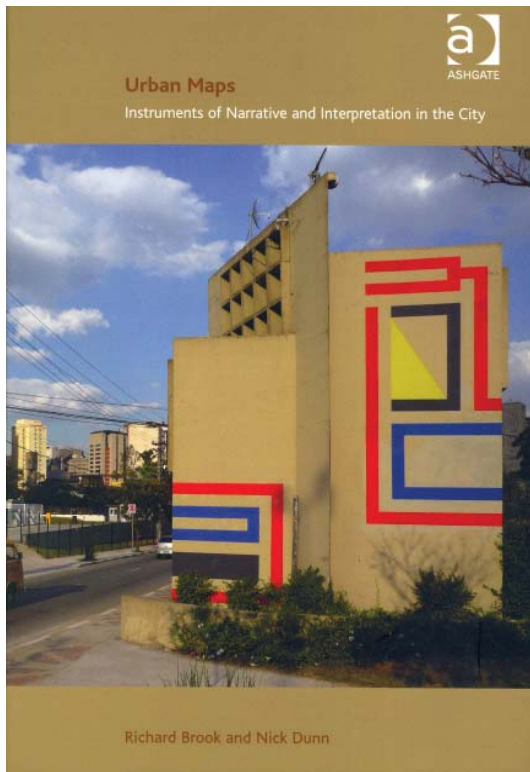
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## REVIEW OF URBAN MAPS: INSTRUMENTS OF NARRATIVE AND INTERPRETATION IN THE CITY BY RICHARD BROOK AND NICK DUNN.

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Remah Y. Gharib



The 'Urban Maps: Instruments of Narrative and Interpretation in the City' is co-authored by Richard Brook and Nick Dunn. This book is a continuation of a long growth of research and the deep efforts into the field of understanding the urban environment. The authors have extensive works and contribution in this field, both have previously edited a book in 2009 'Isolative Urbanism: an ecology of control,' which focused on the relationship between the urban conditions and the ownership of space, public and private, how the space is demarcated, and what are the roles of governance and security upon civic, urban and personal space. They added another input with a co-authored chapter within the 2009 edited publication 'The Control of Space: mediating fear in the urban condition,' as a product of the research-by-design/design-by-research unit at the University of Manchester. Both are well engaged with the academic and professional work at local and international levels through collaborative architectural think-tanks and the research unit which is concerned with the mapping and representation of urban networks, policies, planning and regulation and the impact that this has on the urban form, evolution of space and their materiality.

In focus, publications that usually interconnect two or more disciplines to produce a new interpretation or understanding of the urban elucidation, take the challenge of fulfilling the macro and micro levels. However, Brook and Dunn's utilized Urban Maps with a merge of diverse media and art practices to provide a wider framework of urban theory and new revelations. This is a unique book; the authors have stretched their thoughts to flee out of the conventional box of understanding the urban environment to include various instruments of the surrounding media, and to see the city from a different perspective and alternative modes of analysis. This publication is divided into 7 chapters including the introduction and conclusion chapters. In addition, it is readily friendly book with sufficient use of case studies to enhance the clarity and simplicity.

Through the introduction, Brook and Dunn's have significantly demonstrated the urban evolution of cities and the application of media sources to give new dimensions and criteria that may shape them in the future. They have explored the different forces and conditions of urbanism and being intrinsic to the super-modern conurbation. As well, they have explored the sense of place by defining the change, which occurs to the space via two trends, the 'erosion of space' and 'confusion of space'. This part also drew the attention of the reader to the evolution of the cities' urban landscape with the essential need of the 'Map'. The authors presented the way in which maps can be used in reading and interpreting the city form and the history of urban remodeling. They expressed the different thoughts and models of urban theorist since the beginning of the 20th century, going through the work of Robert E. Park, Ernest W. Burgess, Kevin Lynch, Jane Jacobs, and Reyner Banham. Notably, the

authors tied this historical evolution with the media produced at that time expressing the different arts and sciences and the ideas informed whilst not consistently overt in the texts of the theoretical and urban critics. By this methodology the book gives the reader a glance across the city from a different scope.

The following main chapters are quite independent; focus on several tools and instruments of how to interpret the new aspect of 'urban' rather than the 'city.' This discussion complements the concept of the gradual scale shifting to reduce the understanding of urban scale, which evolved from the beginning of the 21st century through both theoretical and practical perspectives. Chapter 2 discusses the role of 'brand' making and increase of the society consumption along with their effect of the spatial orders of the contemporary city. First, the chapter defines the essential values offered by imaging and signage and subsequently the focus on visualization. The authors explicitly use several international examples to show the concept of branding within the urban realm and the way in which a visual message is conveyed. Later, the chapter described how the walls of the city have been developed by capitalism governance and digital advertisement tools that, in essence, act as brand and imaging tool itself. The authors also offer a discourse that pertain to the 'sign' and its influential role in invading the entire urban environment and presiding over major architectural productions.

Chapter 3 discusses the emerging scope of understanding networking within the city through the new boom of telecommunications and its ability for seeing the exponential expansion. According to the authors, new digital devices



interpret the urban setting with an abstract form plus abandoning the social dimension. However, some digital handheld tools have overcome this dilemma through simplified titling rather than expressing the real experience. The crux of this argument is how the networking can be described on digital maps and tools putting the urban navigation and the individual situation at the same time. In chapter 4, the authors took a further step and focused on the use of films in understanding the urban realm by their articulation of the temporal dimension. They argued that the knowledge of the urban landscape can be expanded through incorporating the physical setting with the experience(s) being held and this can only be gathered from films to add another layer on urban mapping.

In chapter 5, in reference to the phenomenon of the city fragmentation into smaller urban spaces, districts have emerged not just to create the center of the city but to form its own identity as well. The chapter discusses the work of local artists to mark and distinguish each district through graffiti and art work. The authors expressed the notion of graffiti through history and the acts of territorialization, which has an impact on the city mapping. On the other hand, these acts of graffiti have produced another layer of mapping, through understanding the spaces of action and their aspects of control, safety and surveillance. Notwithstanding, the concept of using the city as large drawing board, these marking tools also had their impact on the understanding of the social strata of different urban districts. In essence, they give urban mapping another distributional social dimension.

In chapter 6, the authors focused on the production of physical art and its association

with architecture. This chapter explores the effect and meaning surpassed by artistic objects and the various physical and cultural relationship conceived in a certain urban setting. It was essential within this book that the authors focus on the 'object' within the urban realm due to its effect on perceiving space and other various meanings. Into a further scope, the chapter discussed the 'object' as an element embedded within architecture or within the urban setting.

By and large, the book provides several techniques of using 'maps' and explores the soft and unseen information that can be gathered to explain many dimensions that go beyond the physical dimension. The authors have emphasized the relationship between the acts of visualization and mapping techniques that produce significant opportunities of understanding networking and acknowledging the urban evolution and various social and artistic trends in contemporary urban settings. This is an important contribution to the architectural and urban library, which advances the discussion on analyzing the urban condition in contemporary cities. The book will be of interest to a wide spectrum of reader types, from artists to urban planners and from architects to graphic designers.

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