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Evaluation Research as a Mechanism for Critical Inquiry and Knowledge Construction in Architectural and Urban Education

Abstract

This paper responds to the misconceptions that continue to characterize the delivery of knowledge content in architectural courses. Based on reviewing the literature on pedagogy, the paper explores the value and benefits of introducing evaluation research as a mechanism for critical inquiry and knowledge construction in theory courses in architecture and urbanism. A framework is developed and employed to demonstrate how this type of learning can be incorporated. The development and implementation of a series of in-class and off-campus exercises in two different contexts reveal that structured actions and experiences help students control their learning experience while invigorating their understanding of the knowledge delivered in a typical lecture format. It firmly believed this would offer students multiple learning opportunities while fostering their capabilities to shift from passive listeners to active learners and from knowledge consumers to knowledge producers.

Keywords: Architectural and urban education; inquiry-based learning (IBL); evaluation research; experiential learning; active learning.

Introduction

Discourses in architectural and urban education corroborate that a university's mission should advance a learning environment that cultivates exploration and critical thinking. Today, inquiry and investigation are viewed as activities central to architectural and urbanism pedagogy, presenting new opportunities for academics to strengthen undergraduate courses, to enhance their role in shaping education in architecture, and to improve the overall quality of pedagogy. Throughout the past two decades, influential literature was introduced to the academic community in architecture (UIA-UNESCO Charter, 1996; Boyer & Mitgang, 1996) indicating that architectural education does not take full advantage of the unique opportunities available in higher education institutions. Links between education, professional practice, and academic research are often oversimplified. Opportunities to enrich and strengthen professional education through exposure to research processes are missed.

This paper underscores the value of evaluation research as a form of inquiry-based learning (IBL). It argues for exposing students to primary source materials and for educating them about the production of knowledge. This is proposed to complement traditional teaching practices that emphasize secondary source information and knowledge consumption by offering students ready-made interpretations. Primary sources enable students to get close as possible to what actually happened or is happening during a historical event or time period. Evaluation research is an important paradigm that would invigorate future architects to think critically, be more culturally and environmentally responsive, and engage in knowledge production.

A Critical View of Knowledge Delivery and Acquisition

In traditional pedagogy, architecture students are typically encouraged to engage in site visits and walkthroughs in the built environment to observe different phenomena. Unfortunately, however, literature indicates that these visits and exercises are not structured with rigorous

investigation or critical inquiry (Salama, 1995; Bose, 2007). Moreover, in large classes, the proposition of a site visit is often met with logistical difficulties and little opportunity for individual student mentoring.

While architectural educators strive to impart the requisite knowledge necessary for successful practice, their approaches often diverge depending on the educator's priorities and ideals. Therefore, what and how knowledge is transmitted has significant professional and social implications (Salama, 2009). In this respect, Rapoport introduced many questions regarding "knowledge about better environments," which are: "what is better, better for whom, and why is it better?" (Rapoport, 1994:35). Key idiosyncrasies that continue to characterize teaching practices in architecture and urbanism involve gaps between what and how.

When teaching any body of knowledge, educators tend to present it as facts, theories, and as a process of scientific criticism. Processes leading to an outcome are often hidden and internalized. There should be a distinction between the types of knowledge resulting from research in architecture; students should be given the opportunity to experience these types. The first type consists of research that tests accepted ideas and knowledge resulting from research that seeks to understand the future through a better understanding of the past. The second type comprises knowledge resulting from research that develops new hypotheses and visions and research that probes new ideas and principles that will shape the future.

Knowledge is usually presented to students in a retrospective way. Nevertheless, abstract and symbolic generalizations used to describe research results do not convey a sense of the behaviour of the phenomena they describe (Schon, 1988). Here, the term "retrospective" means extensive exposure to an architect's performance over time. Educators tend to offer students experiments in the form of hypothetical design projects that neglect many contextual variables. In this respect, learning from the actual environment should be introduced. It can provide students with opportunities to understand the practical realities and variables that affect real-life situations (Salama, 2008). This would foster their abilities to explore issues associated with the relationship between users and the buildings they use.

Evaluation Research and Inquiry Based Learning (IBL)

IBL is an instructional method developed during the 1960s that continues to characterize current interests in higher education (Ackoff, 1974; Salama, 2009). It was developed in response to the perceived failure of more traditional forms of instruction, in which students were required simply to memorize and reproduce instructional materials. Active and experiential learning are sub-forms of IBL, in which students' progress is assessed by how well they develop experiential, critical thinking and analytical skills, rather than how much knowledge they have acquired.

The value of active learning is evident since the amount of information retained by the students declines substantially after ten minutes (Bonwell, 1996). The results of research comparing lecturing versus discussion techniques indicate that students favour discussion methods over lecturing and the one-way mode of knowledge transfer. Experiential learning, on the other hand, refers to learning in which the learner is directly in touch with the realities being studied (Keeton & Tate, 1978). It is contrasted with learning in which students only read about, hear about, talk about, or write about realities they never experience as part of the learning process.

Mistakenly, some educators equate experiential learning only with off-campus or non-classroom learning. In architectural and urbanism pedagogy, however, a class in history or theory might incorporate periods of student practice on theory exercises and critical thinking problems, rather than consist entirely of lectures about theories of architecture and the work

of famous architects. Similarly, a class in human-environment interactions might involve critical analysis exercises about how people perceive and comprehend a built environment. Both classes might involve field visits to buildings and spaces where students engage closely with the environment, exploring culture, diversity, and people's behaviour while being part of that environment (Salama, 2006). All of these mechanisms involve an experiential learning component.

Evaluation is an area of research and a mental activity devoted to collecting, analysing, and interpreting information. Evaluation studies in architecture are intended to provide reliable, useful, and valid information, with overarching objectives that include developing a database about the quality of the built environment, identifying existing problems or needs and their characteristics, and providing a basis for predicting the quality of future environments (Preiser, 1989; Preiser & Vischer, 2005).

Assessment of environments as a generator of knowledge and a valuable research vehicle needs to be introduced in lecture courses, establishing a knowledge base about the built environment that can endow students with more control over the process of knowledge acquisition, assimilation, and utilization in future experiences. This argument corresponds with John Habraken's statement when he argued:

> We need to teach knowledge about everyday environment. How it is structured, what we can learn from historic and contemporary evidence, how different examples compare, how it behaves over time and responds to change of inhabitation or other circumstances . . . Knowledge of everyday environment must legitimize our profession. (2006: p. 18).

Linking evaluation research and IBL, one can argue that architecture students need to be involved in evaluation processes that should be conducted objectively and systematically — but not through casual interviews or observations that may only reveal what is already known. In this context, they learn about problems and potentials of existing environments and how they meet people's needs, enhance and celebrate their activities, and foster desired behaviours and attitudes.

Evaluation Research: A Paradigm for Utilising the Built Environment as an Open Textbook

While different evaluation research exercises have been developed and implemented by the author in different contexts, the examples presented here are limited to a Socio-Behavioural Factors in Design elective course offered in the Master of Architecture program at Queen's University in Belfast. This was performed by assigning two major exercises; the first was "Contemplating Settings," and the second was "Procedural Evaluation." The two exercises adopted the concept of the built environment as an open textbook and as a teaching tool.

The number of students enrolled in class was 22. They were sensitized toward understanding key issues relating to research ethics through reading different documents adopted by the School Research Ethics Committee. Most importantly, they were to use unobtrusive photography and walkthrough in a manner that does not reveal people's personalities and identities or interfere with their activities in public spaces.

Contemplating Settings

In the first five weeks, students were introduced to a number of sociocultural and behavioural phenomena that included privacy, personal space, territoriality, crowding, and density. Examples describing these phenomena were displayed to students to illustrate what each

phenomenon encompassed (Figure 1). The purpose was to complement knowledge acquired in lectures by exposing students to real-life conditions. They were required to take concepts underlying each phenomenon in abstract terms and to turn them into concrete terms through description and interpretation of the situations observed.

Students were to record and document cultural and behavioural phenomena by photographing selected settings. Two photographs that illustrated each phenomenon were required. A number of rules were established where photographs should be taken for a real-life situation to represent indoor or outdoor spontaneous settings. Students were required to write one statement describing the setting in physical, cultural, and/or behavioural terms. Contained in the structure of each statement were simple questions such as who is doing what, where, how, for how long, and with whom. Assessment criteria were delivered to students; these included how accurately their text and photographs reflected the meaning of the phenomena as discussed in the lectures and how their interpretations showed a scholarly understanding of the term and the selection of the setting. The overall quality of photographs and graphic layout of their submissions were important criteria for evaluating their work and assessing the overall learning outcomes.

Figure 1: Different environmental settings assessed by the students.

An important finding indicates that while all students were able to observe, document, and interpret the information, most of them could not phrase concise statements that described each setting. However, in a group discussion for debating in which students work among themselves with the facilitation of the author, they were able to recognize how people behave in a specific environmental situation. This included their body gestures, degrees of socialization, and how they attempt to control their environment, shape and transform the physical aspects of the setting to support their activities, and enhance their position in space, create views, or block distractions.

Procedural Evaluation and Assessing Spatial and Sustainable Design Characteristics

To introduce the procedural evaluation mechanism, a survey tool was devised, the purpose of which was to develop students' ability to have control over their learning by establishing links between spatial and sustainable design parameters of a building or a group of buildings. The exercise was conducted through self-guided tours. Checklists were provided to offer students a procedure for taking a structured walk through and around a building. The evaluation

strategy in this context was considered to be impressionistic, which increases students' awareness by focusing on specific factors.

Students were divided into four groups, each of which conducted the exercise utilising the multiple category building appraisal tool. Four buildings in Belfast were selected based on their familiarity to the students: Students' Union and Professional Education Centre of Queen's University, University of Ulster College of Arts in Belfast, and Grove Wellbeing Centre. A number of key factors were identified under four categories: (a) planning and zoning, (b) landscaping, (c) designing, and (d) energy and waste. Checklists were phrased in the form of questions underlying each category.

Table 1: Example category utilised in procedural evaluation.

Factor 3: LANDSCAPING	
Highly Appropriate 1 2 3 4 5 Highly Inappropriate	**Score**
• How effectively are the site features kept? (Consider levelling, excavations, and land filling). • Does the landscape design integrate the site with the surrounding environment? (Is the site surrounded by fences? If so, consider their materials). • How effectively does the design of landscape items avoid the use of synthetic materials? (Consider the materials used for walkways and the asphalt pavements of the parking area.) • Does the project introduce softscape elements like plants and shrubs? If so, how effective are they? (Consider their harmony with the existing natural environment). • How effectively is site furniture like seats, pergolas, and garbage boxes installed in and distributed within the site? (Consider their location, materials, and manufacturing). • How well are the routes around and within the site marked? Are the markings clear and easily understood? (Consider directional signs, their location, content, and material). • Are there any signs for environmental education purposes? If so, how effectively do they convey messages about appropriate behaviour? • Are the pedestrian paths and other hardscape elements made of natural or recycled materials? • Does the site have a reused water system, i.e., grey water? If so, how effective is it? (Consider capturing rainwater and reusing it for irrigation or other purposes.) • How effectively does the project introduce native plants that require the least amount of watering? Average Score (total/10) = ------	-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------
Provide or other forms of illustrations that represent issues underlying sustainable landscape design.	A summary paragraph should be written describing how well landscape design deals with sustainability-related issues.

The process included the use of notes, sketches, diagrams, and verbal description. Table 1 illustrates an example data sheet used to conduct the evaluation. Questions were designed in a generic manner that reflected the essence of each category. Students' attention was drawn to the fact that the list of questions underlying each category was not exclusive and was introduced to help structure and guide their tours for the purpose of the exercise.

Numerical scores were assigned to the questions to represent the degree of appropriateness underlying each factor using a point scale method. Scores were averaged, and an overall score for the building was then computed. Students were required to develop a report that would consider the following:

- Description of the building appraised with the support of photographs and illustrations;
- Appraisal of the building using the checklists with numerical scores assigned for each question;
- Analysis of numerical ratings by computation of an average score for each category and for the overall score; and
- Writing comments based on students' impressions and understanding of the building.

The findings point out that the students were able to make judgments about the built environment and give reasons for those judgments. Yet, students' analyses revealed shortcomings in their abilities to comment, whereas a few students could not express their concerns verbally and could not write an understandable reporting statement. Also, a smaller number of students was not able to recognize similarities and differences between the questions. However, they commented that checklists and survey tools for investigating the built environment helped them recognize exactly what to look for in the building and to understand relationships between different factors while comprehending the impact of one factor as opposed to others.

Other Contexts for Integrating Evaluation Research as an IBL Mechanism in a Classroom Setting

As a continuous effort to introduce IBL into theory courses, a series of tools were developed by the author and were implemented as exercises during his teaching in two different contexts, as follows:

- Socio-Behavioural Factors in Design, First Year, M. Arch.-RIBA-II at the School of Planning, Architecture, and Civil Engineering--SPACE, Queen's University, Belfast (academic year 2008-2009).
- Community Design Workshop, Third Year, B. Arch., Department of Architecture and Urban Planning at Qatar University (academic years 2009-2010 and 2010-2011).

While the exercises were introduced in different grade levels, there was one shared aspect: the nature of the courses in which they were introduced. Specifically, the courses address person-environment interactions and explore the relationship between human behaviour and different types of environments and the impact of those environments on individual, community, and societal attitudes. In essence, this reflects the amenability and implement-ability of the exercises on different levels and in different contexts. Despite the fact that each course is introduced in a context aimed at achieving specific objectives and learning outcomes, an integral component in the two courses is an intensive discussion of issues that pertain to ways in which information about sociocultural factors and environment-behaviour knowledge can be applied to design projects. It should be noted, however, that the objective here is not to compare the two, different contexts, but to illustrate the way in which IBL was introduced and implemented. The shared objectives of the courses offered in the two contexts can be exemplified as follows.

- *To increase* students' sensitivity to the built environment and to break any habits of taking the environment for granted.

- *To acquaint* students with particular knowledge of a variety of environments, including residential, work, learning, and urban.
- *To enhance* students' understanding of the core concepts regarding human-environment relations and how these concepts vary by different cultures and subcultures.
- *To develop* students' critical thinking abilities about the role of the built form in fostering, enhancing, or inhibiting cultural behaviours and attitudes.

The selected examples of exercises were envisioned to complement different types of knowledge offered to students in the typical lecture format. The instructor explained the exercises to the students and the way in which they are linked to the body of knowledge and experiences students have already gained in the course and in other courses. While some exercises were performed in groups of two or four, others were individual exercises based on the nature of each and the type of issues involved. Each exercise was followed by a class discussion moderated by the tutor in which all students have opportunities to voice their thoughts to the whole class. The following are three examples selected from a wide variety of exercises utilised as in-class, IBL mechanisms.

Culture and Environment: Relating Visual Attributes of Buildings to Culture

- *Purpose*: The purpose of this exercise is to offer students the opportunity to translate their understanding of a building image into responses that relate culture to architecture and that link the built environment to the community within.
- *Prior Knowledge*: Students have been introduced to the dialectic relationship between culture and environment and how culture is manifested in human artefacts and buildings/built environments. The basic premise in this context is that culture appears in objects and in the environment as a result of people's interpretation of such an environment and is based on a set of values and beliefs. In essence, it adopts the view that any object embodies human choices and preferences.
- *Requirements*: Three different images that represent different cultures were presented. Students were required to describe each image in one or two sentences only, think of what culture each image belongs to, and state at least three visual/formal attributes that influenced their answer (Figure 2). The exercise is conducted in 15 minutes and is performed in teams of two, as each two neighbouring students have to articulate an answer based on their agreement.

Recognition of Building Types: Relating Building Images to Functions and Users

- *Purpose*: The purpose of this exercise is to develop students' visual perception abilities regarding how to recognize different building types based on their understanding of their visual characteristics and the messages they convey.
- *Prior Knowledge:* Through a series of lecture presentations preceding this exercise, students were introduced to notions that pertain to expression in architecture; how buildings have certain characteristics that convey messages about the use, functions, and activities that take place inside them; and how they offer some clues about who uses them.
- *Requirements:* Students were offered a sheet that includes 12 images of different buildings selected from different environments. They were required to look carefully at the images and then state the type, activity, and the age group for each of the images utilising the two left columns given in the sheet (Figure 3). The exercise is conducted

in 45 minutes and is performed in teams of two, as each two neighbouring students are required to discuss the images and reach an agreement on identifying the building type, activity, and user type of each image.

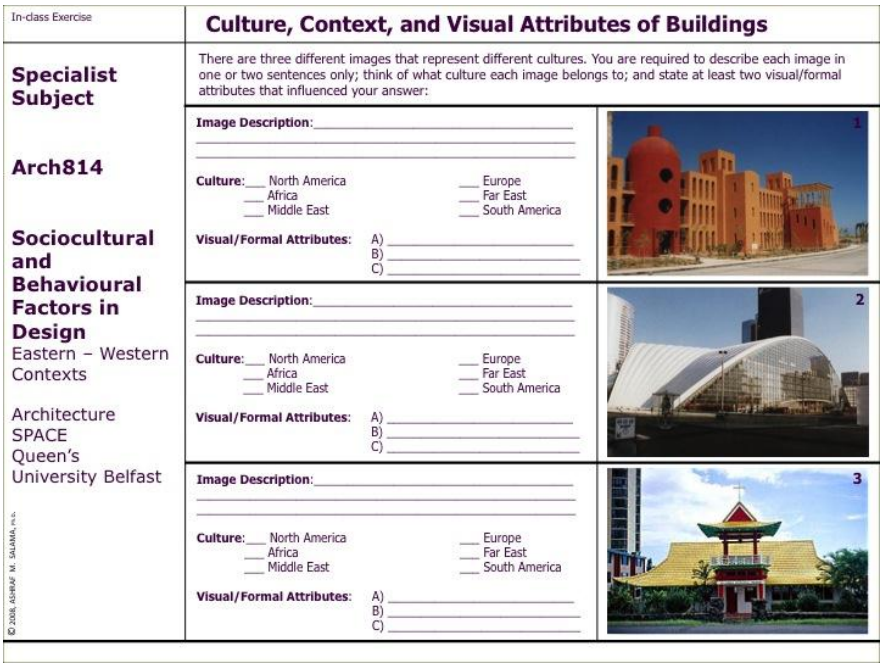


Figure 2: Relating visual attributes of buildings to culture.

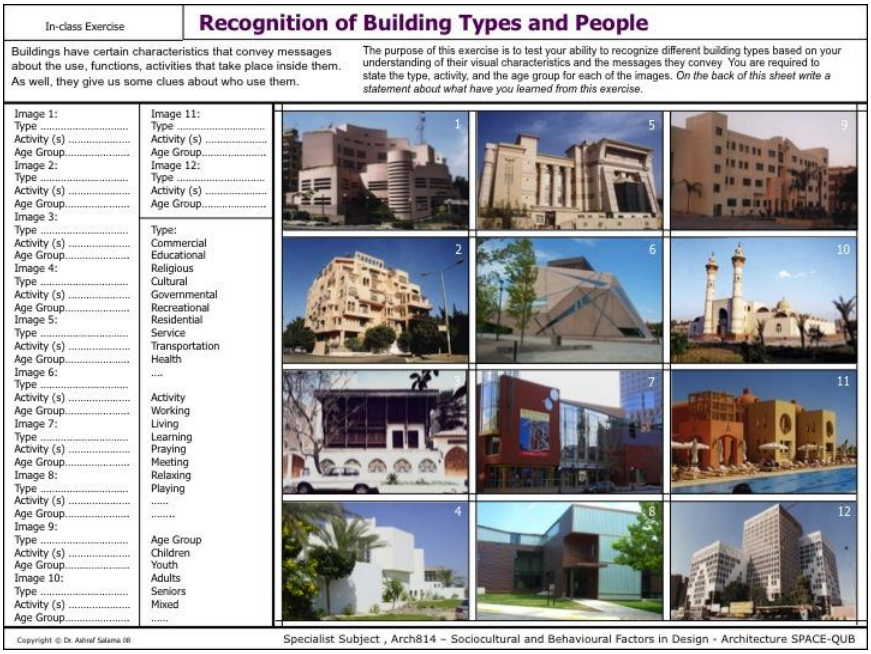


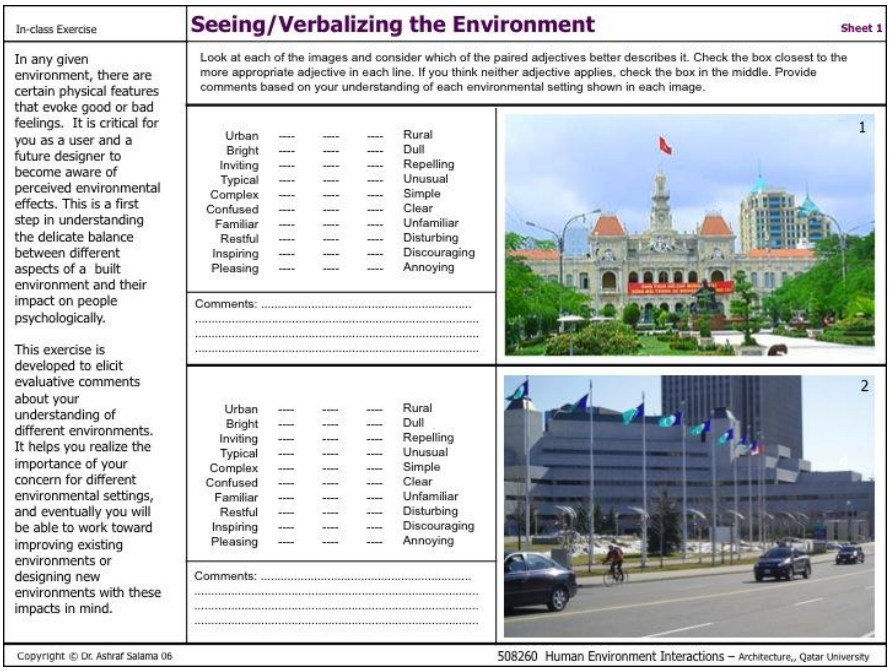
Figure 3: Relating building images to functions, activities, and users.

Seeing and Verbalizing the Environment

- *Purpose:* This exercise is developed to elicit evaluative comments about students' understanding of different environments. The aim is to help them recognize the importance of the terminology used by the public and the terminology used by architects and designers. Another aim is that students can express their concerns about

different environmental settings and eventually be able to work toward improving existing environments or designing new environments.

- *Prior Knowledge:* Students were introduced to the way in which buildings relate to the psychology of the users. Knowledge delivered and discussed prior to conducting this exercise included issues that pertain to the fact that in any given environment there are certain physical features that evoke good or bad feelings. It is critical for students, as users and as future designers and architects, to become aware of perceived environmental effects. This is a first step in understanding the delicate balance between different aspects of a built environment and their impact on people psychologically.
- *Requirements:* Students were offered 6 images and were required to look at each of the images and consider which of the paired adjectives better describes them. They were to check the box closest to the more appropriate adjective in each line. If they thought neither adjective applied, they were to check the box in the middle (Figure 4). As well, they were required to write generic comments based on their understanding of each environmental setting shown in each image. The exercise was conducted individually and was performed over a period of 30 minutes; each student was expected to spend 5 minutes only on each image.


In-class Exercise

Seeing/Verbalizing the Environment Sheet 1

In any given environment, there are certain physical features that evoke good or bad feelings. It is critical for you as a user and a future designer to become aware of perceived environmental effects. This is a first step in understanding the delicate balance between different aspects of a built environment and their impact on people psychologically.

This exercise is developed to elicit evaluative comments about your understanding of different environments. It helps you realize the importance of your concern for different environmental settings, and eventually you will be able to work toward improving existing environments or designing new environments with these impacts in mind.

Look at each of the images and consider which of the paired adjectives better describes it. Check the box closest to the more appropriate adjective in each line. If you think neither adjective applies, check the box in the middle. Provide comments based on your understanding of each environmental setting shown in each image.

Urban	----	----	----	Rural
Bright	----	----	----	Dull
Inviting	----	----	----	Repelling
Typical	----	----	----	Unusual
Complex	----	----	----	Simple
Confused	----	----	----	Clear
Familiar	----	----	----	Unfamiliar
Restful	----	----	----	Disturbing
Inspiring	----	----	----	Discouraging
Pleasing	----	----	----	Annoying

Comments: .....

1

Urban	----	----	----	Rural
Bright	----	----	----	Dull
Inviting	----	----	----	Repelling
Typical	----	----	----	Unusual
Complex	----	----	----	Simple
Confused	----	----	----	Clear
Familiar	----	----	----	Unfamiliar
Restful	----	----	----	Disturbing
Inspiring	----	----	----	Discouraging
Pleasing	----	----	----	Annoying

Comments: .....

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Figure 4: Seeing and verbalizing the environment.

After conducting each of the three exercises, students were asked to elaborate on what benefits they have gained out of their engagement and reflect on their experience. The findings point out that the students were able to make judgments about the built environment and to give reasons for those judgments through a wide spectrum of exercises. However, a few students could not recognize similarities and differences between the building images or fully comprehend the crux of each exercise. Nevertheless, they commented that utilising checklists and discussion tools for relating the content of the course to the exercises helped them recognize what to look for exactly in the building images. Students reported that they were excited during the discussions. In their comments, the majority felt that their experience of the buildings in a structured manner invigorated their understanding of many of the

concepts typically delivered in a lecture format without exposure to generating discussions or debates in the classroom. As well, writing and presenting were considered important skills they needed to develop. The discussions that followed each exercise corroborated the value of introducing in-class, IBL mechanisms while creating an atmosphere amenable to responsive reflection and critical thinking.

Toward a New Form of Knowledge-Based Pedagogy

By and large, the results of implementing evaluation research as a form of IBL were not exclusive; nevertheless, they accentuated the value of introducing assessment studies through structured interactive learning mechanisms, while utilising the built environment as an educational medium. Students developed a deeper understanding of the relationship between people and the settings they use and between spatial and sustainable design factors. They were able to focus on critical issues that go beyond those adopted in traditional teaching practices.

The two widely held conceptions of the built environment and the physical/objective, were embedded in the exercises. While the exercises emphasised knowledge acquisition based on students' perceptions and interpretations of the built environment driven by knowledge delivered in the classroom, they also attempted to develop students' understanding of how qualitative aspects of the built environment could be translated into quantifiable measures. The exercises helped students focus on specific aspects of the built environment that pertain to a specific knowledge content while conceiving the gaps between "what" and "how" types of knowledge.

A considerable portion of students' education is based on experience and active engagement. Students are typically encouraged to study the existing built environment and attempt to explain it through theories or typologies, always looking at outstanding examples. Underlying these theories, however, are assumptions about the built environment and the people associated with it, and usually these assumptions remain hidden. It is in this relationship where the lesson to be learnt lies. The incorporation of exercises similar to the ones presented would foster the establishment of links between the existing dynamic environments, the concepts and theories that supposedly explain them, and the resulting learning outcomes. Concomitantly, the contribution of evaluation research and IBL to architectural and urban pedagogy lies in the fact that the inherent, subjective, and hard-to-verify conceptual understanding of the built environment is complemented by the structured, documented interpretation. This was performed in a systematic manner in a classroom or off-campus setting amenable to critical thinking and reflection.

The built environment is variable, diverse, and complex. Buildings, spaces, and settings are major components of this environment: designed, analysed, represented, built, and occupied. They are also experienced, perceived, and studied. They should be redefined as objects for learning and need to be transformed into scientific objects. It should be emphasized that in order for an object to be taught and learned, its components should be adapted to a specific pedagogic and cognitive orientation that introduces issues about specific bodies of knowledge. Evaluation research would thus achieve this desired end.

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References

Ackoff, R. (1974). Redesigning the future: A systems approach to societal problems. New York: John Wiley.

Bonwell, C. (1996). Building a supportive climate for active listening. *The National Teaching and Learning Forum*, *6*(1), 4-7.

Bose, M. (2007). Design studio: A site for critical inquiry. In A.M. Salama & N. Wilkinson (Eds.), *Design studio pedagogy: Horizons for the future* (131-141). Gateshead, UK: The Urban International Press.

Boyer, E.L., & Mitgang, L.D. (1996). Building community: A new future for architectural education and practice. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Habraken, J. (2006). Questions that will not go away: Some remarks on long term trends in architecture and their impact on architectural education. *Open House International*, *31*(2), 12-19.

Keeton, M., & Tate, P. (Eds.). (1978). Learning by experience. San Francisco, CA: Jossey-Bass.

Preiser, W.F.E. (Ed.). (1989). Building evaluation. New York: Plenum.

Preiser, W.F.E., and Vischer, J. C., (Eds.) (2005). Assessing building performance. Oxford, UK: Elsevier.

Preiser, W.F.E., and Schramm, U. (2005). A conceptual framework for building performance evaluation. In W.F.E. Preiser & J.C. Vischer (Eds.), Assessing building performance (15-26). Oxford, UK: Elsevier.

Rapoport, A. (1994). The need for (what) knowledge. *Proceedings of the 25th Annual Conference of Environmental Design Research Association (EDRA): Banking on design* (35-39). San Antonio: TX: EDRA.

Salama, A.M. (1995). New trends in architectural education: Designing the design studio. Raleigh, NC: Tailored Text and Unlimited Potential Publishing.

Salama, A.M. (2006). Learning from the environment: Evaluation research and experience based architectural pedagogy. *CEBE Transactions – Journal of the Centre for Education in the Built Environment*, *3*(1), 64-83.

Salama, A.M. (2008). A new theory for integrating knowledge in architectural design education. *Archnet-IJAR, International Journal of Architectural Research*, *2*(1), 100-128.

Salama, A.M. (2009). Transformative pedagogy in architecture and urbanism. Solingen, Germany: Umbau Verlag.

Schon, D. (1988). Toward a marriage of artistry and applied sciences in the architectural design studio. *Journal of Architectural Education*, *41*(4), 16-24.

UIA UNESCO Charter for Architectural Education (1996). Available at: http://www.unesco.org/most/uiachart.htm (Accessed: January 19, 2004).