A paradigm in architectural education:
Kolb's Model and learning styles in studio pedagogy

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ABSTRACT:

In line with "learner-centered" teaching paradigm (Weimer 2002), enhancing learning experiences in design studio should be a fundamental concern positioned at the center of attention in current discourses of architectural education research. This focus warrants further studies on students' cognitive patterns and learning processes to identify what goes in learners' minds, and how learning style variations affect knowledge acquisition. In the applied and overlapping fields of architecture, urban design, and landscape architecture, drawing on cognitive studies and Kolb's Experiential Learning Model have important implications for integrating and transferring learning in seminar/lectures to studio environments. Cognitive psychologists make distinctions between "declarative" recalling of factual knowledge and "procedural" knowledge of knowing to perform activities (Bruning, Schraw, and Ronning 2004:46-48). "Structural knowledge" is referred to "as internal connectedness, integrative understanding, or as conceptual knowledge" that "is used to develop procedural knowledge to solving domain problems," involving the integration of declarative knowledge (Jonassen, Beissner, & Yacci 1993: 5). Kolb (1984) similarly describes how "learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it (Kolb 1984:41)." Various knowledge types are integral to learning in architectural education; thus, this paper proposes a course design model that investigates various knowledge implications. On the one hand, the studio environment, although productive and rich in learning experiences and professional opportunities, sometimes can be stressful, where teacher/peer pressures and competitive attitudes negate learning potential and lead to unproductive results. A one-semester long studio might not always offer the required time or space to learn procedural knowledge, for example, to solve complicated urban design problems, and in particular, to recognize multiple patterns affecting an urban/suburban context. However, lectures/seminars, on the other hand, usually attempt to convey significant declarative knowledge in one semester, sometimes without addressing actual application to studio projects. The objective of this paper is to propose a learner-centered pedagogical framework that applies Kolb's Experiential Learning Model and integrates and foster significant interplay between the learning of *declarative knowledge* in theory classes and the *procedural knowledge* needed to solve design problems in studio environments.

INTRODUCTION

This paper renders a learner-centered, integrative theory-studio pedagogy design that enhances cognitive learning processes, both declarative and procedural, by applying the four dimensions of David Kolb's experiential learning Model (Kolb1984). Cognitive psychologists make distinctions between declarative recalling of factual knowledge and procedural knowledge of knowing to perform activities (Bruning, Schraw, and Ronning 2004:46-48). The design based on Kolb is dynamic and multidimensional. It embraces Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation, which also contains multiple learning styles. By applying Kolb's model to theory-studio design, the diverse learning styles of all learners are incorporated and a step-by-step course design framework   enables studio and seminar design instructors to guide learners through each phase of the learning cycle. Additionally, the model further demonstrates how assessment of each type of knowledge and learning is embedded in the cognitive learning processes.

Original and evolving approaches to course development and syllabus design generate a relevant discourse within design education. The syllabus is an important element that impacts learning by structuring the course design and initial interactions with course materials. Moreover, it is a vehicle for teacher-learner communication throughout the semester. Therefore, to advance emerging design education in professional fields of architecture, landscape architecture, and urban design in the 21st century, it is essential to rethink course design and the syllabus as a critical aspect of improving design education. Together, these aspects should reflect the multidisciplinary nature of the fields and endorse the value of "design mentality."

Students experience and interact with the course syllabus as a handout and preamble to the learning demands of a course. The syllabus should provide a clear roadmap, showing how overall course learning experiences are designed and set the stage for understanding all of the learning processes. It should be able to communicate the pathway students should take to achieve the course learning outcomes. A well-organized syllabus should also reflect an effective course design outlining session-by-session pedagogical strategies and learning processes. An effective syllabus and course design, therefore, can decrease learners' many struggles and frustrations with not really knowing what they are supposed to do. It also cuts down confusion about activities, assignments and evaluation processes. An engaging syllabus that is well designed can increase learning enthusiasm while, however, without effective organization and clarity, it can deter interest, continuously affecting how learners proceed throughout the semester.

1- KOLB'S MODEL: RELEVANCE TO ARCHITECTURAL EDUCATION

David Kolb's experiential learning theory is one of the repeatedly applied didactic theories in higher education. The Kolb's theory is a four-staged learning cycle (Figure 1) that is broad enough to provide a base for the entire course as well as each individual course session or learning experience. Also, this cycle is democratic and diverse that can recognize various learning style. According to Kolb, this complete cycle needs to exist if the learning wants to take place entirely (Kolb 1984). Additionally, Kolb's Cycle is inherently democratic and inclusive in its approach as each stage recognizes distinct learning style variations. Surprisingly, other than few instances, Kolb's Cycle has less been appreciated and applied limitedly to architectural education and even more, specially, what is seen to be highly relevant, to the realm of design studio pedagogy. According to Kolb:

> Learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it. (1984:41)

This paper is a prototype application of Kolb's model to advanced, graduate level and integrative urban design seminar-studio courses for architecture majors. This paper will render, first, how integrating Kolb's cognitive cycle of experiential processes into an urban design course, as a model of course design, leads to further enriching forms of knowledge, both declarative and procedural. Furthermore, in applying Kolb's complete cycle, the diverse learning styles-- identified as "divergers, assimilators, convergers, or accommodators" are represented in the course design (Smith 2001, Threeton & Walter 2009, Chapman 2006). Second, the paper will propose that the course syllabus can extend beyond the typical, and sometimes basic and confusing introduction to the course to become an influential learning medium. When constructed in alignment with the course design proposed, the syllabus can clearly communicates the instructor's approach, instructional choices and serve as an effective medium to promote and enhance student learning. This paper as a whole is a theoretical effort. It demonstrates some of the ways in which instructor-learner transparency in communication, interaction, and expectations can be achieved. For example, well-thought, sophisticatedly designed course experiences and a clear, well-organized syllabus hand-out, in the first day of the class, can be an effective medium to inspire and promote learning.
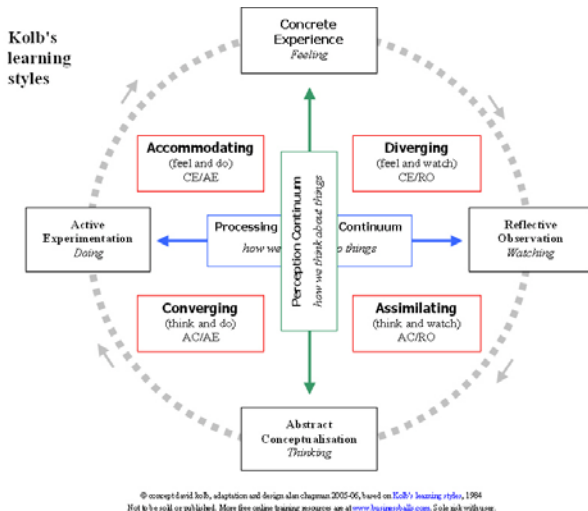
Figure 1: (Image source: Kolb's Cycle's (1984) adaptation and design by Alan Chapman, 2006-05, accessed from website http://www.businessballs.com/kolblearningstyles.htm, date accessed December 20 2010.

1-1- MULTIDISCIPLINARY LITERATURES: LEARNING & KOLB'S APPLICATIONS

Considering the general popularity of Kolb's theory in higher education, a review of multidisciplinary literatures and its various applications reveals limited study of Kolb's model's potentials and promising applications to architectural education. For example, effort has been made to make concrete applications of Kolb in medical education (Armstrong & Parsa-Parsi 2005), engineering education (Abdulwahed & Nagy 2009), and geography (Healey & Jenkins 2000). In architectural education, few studies have partially rendered upon and investigated the role of experiential learning and pointed at Kolb's model (Schon 1984 & 1987, Demirbas & Demirkan 2003, Demirbas ?, Kvan & Yunyan 2005, Salama & Wilkinson 2007, & Sanoff 2007). Distinctly lacking is effort to develop a concrete, "learner-centered (Weimer 2002)" course model using Kolb's experiential learning theory in architectural education.

Despite minor concerns and criticisms with Kolb's theory, summarized at length (Oxendine, Robinson, & Wilson 2004:8), this study argues that Kolb's model serves as a practical and relevant framework, not only in the scholarship of architectural education, but also within the process of professional design practice. Kolb's experiential learning cycle parallels 'design thinking' and is keenly aligned with the broader patterns onto which architects and urban designers set about, select and design, their interventions in the built environment. Due to these strong similarities, Kolb's theory has potential application for participatory planning and design practice as well. For example, Wageningen UR Centre for Development Innovation has used Kolb's model to create a learning environment that encourages community participation in rural developments (http://portals.wi.wur.nl/ppme/?Experiential%20Learning%20Cycle).

Kolb's theory is highly adaptable to a general urban design process. Analogous to Kolb's step-by-step move through stages, a characteristic urban design process starts with a 'concrete' understanding of the built environment and urban context, or an existing spatial problem to be solved. It moves towards 'making decisions' in final design stages, typically, by means of theorization of alternative solution(s) and their 'abstract' realization through audio-visual media such as drawings, rendering, animations, maps, and images. Therefore, Kolb's sequential cycle can house the patterns that are associated with both design education and professional practice, starting with concrete experience and reflection, leading to action and intervention that is founded on abstraction and theorization.

1-2- DESIGN FOR THEORY AND APPLICATION: KOLB, LEARNING STYLES, AND TUTOR-LEARNER RELATIONS

Based on Kolb's Theory, Kvan and Yunyan (2005) studied the correlation of students' learning styles with their performance in architectural design studio. Demirbas and Demirkan (2003) evaluate the effects of learning style preferences on the performance of design students. They conclude that, amongst the students, there were significantly fewer "accommodators" and most were "assimilators" and convergers," moreover, they indicate significant differences in different stages of the design process between students' performances with different learning styles. In an analysis of Demirbas and Demirkan's study, Kvan and Yunyan conclude that:

> …a design studio can encompass a wide range of learning styles if its programs start from ill-defined design problem, permit a range of communication media and are engaged over a relatively long duration, hence allowing more freedom in learning approaches… there is a significant correlation between learning style and students' academic performance in particular design studio…. (Kvan & Yunyan 2005:32)

The following studies are representative in addressing Kolb's experiential theory and the role of directed experience in design education. As Henry Sanoff puts it, *concrete* experiences or "field-experience approach to education" are valuable means for design learners to work with, complementing the *abstract*. This approach promotes "the use of non-formal, out-of-class experiences as the core of the learning process (Sanoff 2007:21)." As a way to integrate theory and practice in design education, Sanoff calls for "action-research" method as an integrated process starting with students' direct experience followed by data collection and observation about that experience, followed by data analyses and conclusions that "are fed back for reflection and modification (22)." Sanoff's "action-research" approach fit well with the Kolb's Cycle as well as the ways by which professionals in their real world practices go about designing buildings and urban places.

Other studies discuss multiple ways in which theory and its applications as design knowledge can be integrated into a learning setting that matches students' capabilities and learning styles. For example, Salama and Wilkinson's comprehensive study addresses cognitive styles in studio pedagogy and how learners acquire applied knowledge in design studio. The study refers to Kolb's "experience…followed by reflection" as an effective approach (Salama and Wilkinson 2007:187), and categorizes "three polar types of styles" of *sequential-holistic, convergent-divergent,* and *impulsive-reflective.* They argue that students should become aware of their preferred styles and be able to switch from one to other when needed (189-190).

"Thinking globally and acting locally, reconciling lectures and studios, and addressing cognitive styles in studio pedagogy" are viewed as three significant approaches to students' semantic knowledge development (188). These contribute to an enhanced learning on creating solutions for concrete places and particular cultures, responding to specific environmental problems and social structures, working with communities and dealing with practical realities, while, at the same time, respecting the order of the physical setting, and providing room for cultural expressions and cultural variations. The study also renders on the 'emotional stress' that is facing students in this process. The authors define cognitive styles as individuals' "aptitude, abilities, attitudes, and working styles." The importance of these should be "identified and made transparent to the students in order to increase the effectiveness of their education" (189)." They conclude:

> Design educators should be able to provide their students with fundamental and ethical knowledge through which they can see beyond their own space, time, and culture, and understand the larger structures and processes of human habitation. …

> This concept can be addressed in studio pedagogy by introducing problems that aim at studying the characteristics of different societies, social classes, and the contextual particularities of different regions (188).

The studio environment, besides being productive and rich in learning experiences and professional opportunities, can sometimes become stressful, where teacher/peer pressures and competitive attitudes negate learning potentials and lead to less fertile results. Few studies have focused on student "lived learning experiences" in design studio as well as the tutor-student relationships in studio pedagogy (Webster 2003 & McLaren 1999). The studies distinguish "liminal servant" as the alternative tutoring paradigm and an "ideal" role for the design tutor in one-to-one tutorials.

Webster's qualitative study considers "project-based learning" to be at the kernel of the pedagogic tools in architectural education. Besides the required and ongoing students' need for 'critical reflection' on their work, satisfactory one-to-one tutoring is also significance in this learning process. The ethnographic research findings conclude that students usually experience three major types of tutor behavior: "the entertainer, hegemonic overlord, and liminal servant." Amongst the three, only "liminal servants," as described by McLaren (McLaren 1999:128), increase the learners' impetus that will support resourceful learning. McLaren defines 'liminal servant' as:

> …a tutor who is interested in assisting the learner to construct their own knowledge (deep learning) through addressing both the cognitive (scaffolding) and social (the underlying belief systems - values, norms, behaviors - implicit in the disciplinary area) dimensions of learning. The 'liminal servant' adopts a student centered approach to the role of tutor by assisting the student to manage and construct his or her own learning through critically reflective dialogue (Webster 2003:109).

Unlike "entertainers" and "hegemonic overlords," "liminal servants" neither are propagandists for a certain architectural culture or style, nor coercive ideologues. They practice two-way communication and a mutuality that understands students' frustration and challenges in studio life. They compassionately allow expressing those frustration and discomfort, and always give students advice and assistance. By enthusiastically engaging with every student ideas, they make them also enthusiastic about their own learning. Transparency of roles, responsibilities, and requirements are also important in this relationship (Webster 2003).

In addition to differences in learning styles, design education should also recognize students' "prior knowledge" and experiences as well as cultural backgrounds in order to promote deep transformative learning. Mainly, by an insider understanding of the students' problems from their perspectives, and by accepting individualistic differences of ideas and learning styles, and helping to develop them, the alternative tutoring attitude is further democratic, better sharing power in class. Design educators should become democratic facilitators who offer design guidance to help students to consciously construct their own learning experiences and assist them to manage and plan for their studio work as well as future design career.

1-3- SEMINAR AND STUDIO PEDAGOGY: SYLLABUS AND COURSE DESIGN

In addition to a critical review of literatures associated with higher education, architectural education, and Kolb's theory, numerous architectural, landscape architectural and urban design studio and seminar/lecture course syllabi have been examined and compared. The aim was to investigate a general ambiance of how much intentionality and creativity goes into putting them together as effective, well-organized, and communicative learning medium. Based on the extensive evaluation, this study wraps up that a commonly recognized pattern amongst them all is that: *only* few seem to be able to thoroughly communicate with students a clear definition of the expected learning experiences and processes that are decisively designed into the course (Figure 2 & 3 show two divergent examples).

Figure 2: This syllabus image, intentionally made illegible, is a generic example of a linear syllabus that is typical of many seminar/studio syllabi found in architecture, urban design and landscape architecture that, often, lacks an easily decipherable and cognizant schema.

Many of the investigated syllabi were 'linear' in narrative, making it difficult to communicate with (Figure 2). Many were also taking further rigid approaches in describing the course itself, the goals and expectations. They were mere indications of important due dates, objective grading criteria on percentage scale, and thickly loaded reading contents. Only a small number of the reviewed syllabi were crafted intentionally with a design that is transparent enough to explicitly communicate the course learning experiences, bit by bit, throughout the semester (Figure 3).

Although this study is NOT making the general claim that linearly-organized syllabus is direct indicative and evidence of instructor's lower performance quality, the syllabus is certainly an important course design element. It is not fully possible to evaluate general success or failure of a course or an instructor's performance merely through the syllabus. However, a well-designed syllabus can be the primary creative space that is reflective of instructors' teaching abilities. Teachers can assume, in their syllabus, they have made their expectations and demands from students fully transparent and clear, but this may not be their right assumption. If their higher expectations were not as clear as they think, students would get more confused and this state of confusion would, to a great extent, diminish their learning efficiency.

Students are often expected to take care of every piece in their studio projects: display paramount design skills, produce inspiring design outcomes, pay decent attention to design process, practicality, and pragmatics of their design solutions, and at the end, bring to the table the highest quality and creative final presentation products. In this case, more work should be done in the part of instructors' responsibility to prepare the grounds for such demands. Therefore, this study invites the realm of design education to rethink the approaches to curriculum design in order to make "projected" or
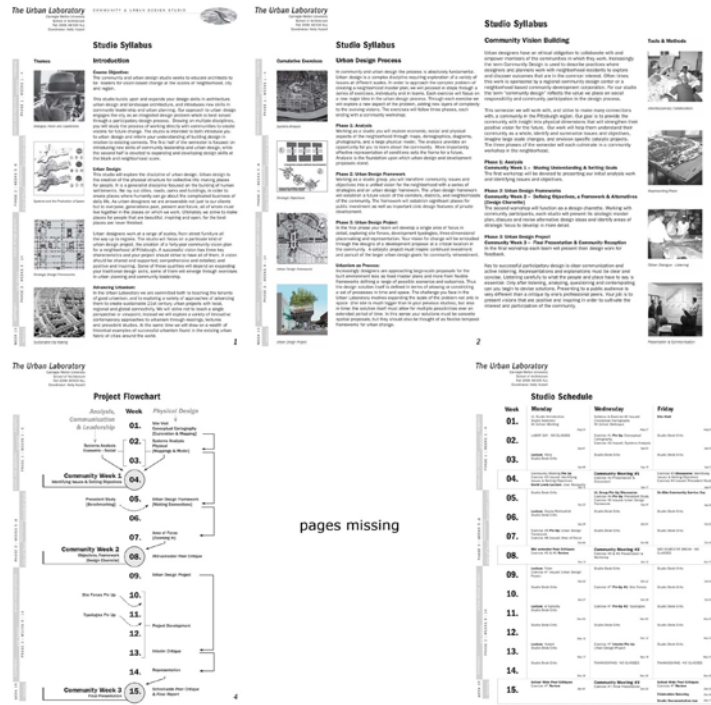
Figure 3: This image shows a less-linear syllabus pattern that can represent a stronger, more communicative approach to curriculum design. Such a syllabus has a 'rhizomatic' schema, the inventive thresholds and openings to new concepts that can visibly convey how, in the course of the semester, the 'learning' would take place.

(Image source: "The Urban Laboratory" studio syllabus, Coordinated by Kelly Hutzell, retrieved from http://www.cmu.edu/rci/images/ulsyllabus_08.pdf)

expected learning, along with the course experiences and outcomes, further translucent to students from the course beginning. Innovative approaches are needed to make the syllabus clear enough for it to be able to reflect the course journey as a whole and act as students' initial and effective roadmap towards learning.

1-4- ENHANCING APPLICATION AND HIGHER LEARNING: PRIOR KNOWLEDGE, META-COGNITION, AND CONCEPTUAL SCHEMA

"Prior knowledge" is an essential element to be not only considered, but also guided and integrated into the learning experiences of any course, architectural education lecture and design courses not excluded. Students enter every classroom or studio setting with misconceptions, existing knowledge, and different ways of looking at the built environment and approaches to studio projects. In other words, design and theory problem-solving tasks require them to apply and enhance their preceding skills and abilities. Therefore, "new knowledge" should always be aware to be built upon "existing knowledge." Instructors should also consider learners' partial understandings, counterfeit beliefs and misconceptions, or those not-yet-mastered skills and naïve interpretations of the course concepts. The "science of learning" elaborated by Branford et al lend resourceful insights to this aspect of the study (Bransford, Brown, & Cocking 1992). Branford et al emphasize on key aspects such as "expert understanding," and transferable and "useable knowledge (9)." The insights from their study can further enrich this exemplar curriculum design case. The authors argue that teachers should pay attention to students' interpretations and endow them with guidance when necessary:

> …Learning is enhanced when teachers pay attention to the knowledge and beliefs that learners bring to a learning task, use this knowledge as a starting point for new instruction and monitor students' changing conceptions as instruction proceeds (11).

> …Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for purposes of a test but revert to their preconceptions outside the classroom (15).

This integrated course and syllabus design exemplar takes a metacognitive approach to instruction in architectural education. This model provides an intelligible framework, a clear "schema" and semantic knowledge that can, visually and perceptively, "chunk" course learning experiences and make the course elements lucid to learners. This actually embodied version of the Kolb's theory is particularly beneficial in teaching urban design topics that are further complex and multidimensional, and contextually sophisticated. This curriculum theorizes to connect design education to the expert meta-cognitive models that take the active-learning and "meta-cognitive" approach to instruction rendered by Branford et al (Bransford, Brown, & Cocking 1992:12). They help learners "take control of their own learning" and giving them a meta-cognitive image tool to actively predict their performance and consciously monitor their progress (18). They also generate sociable learning environments in both classrooms and studio settings. Such spaces enable mutual negotiations on the learning process and a "share of power" with students. The meta-cognitive approach to instruction and syllabus design not only enhances a vigorous transfer of knowledge, but also increases the degree to which learners, without the need for explicit prompting, can transfer theoretical application and design methodology to new situations, contexts, and problems. In addition, based on Kolb's theory, the modeled courses in this paper use multimodal combinations of both "hands-on" teaching techniques, such as inquiry and project based learning experiences, case and precedent studies, and modeling and simulations, as well as "minds-on" moments, like lectures, critical thinking, and reflective experiences.

2- URBAN DESIGN EDUCATION: COURSE DESIGN FOR AN ILL-STRUCTURED DOMAIN

This study approaches the disciplines of architecture, urban design, and landscape architecture as nonlinear and "ill-structured" domains. Therefore, architectural education and design problem-solving differ from well-structured linear disciplines such as the sciences or engineering. An "ill-structured knowledge domain is defined as one that has the following characteristics:
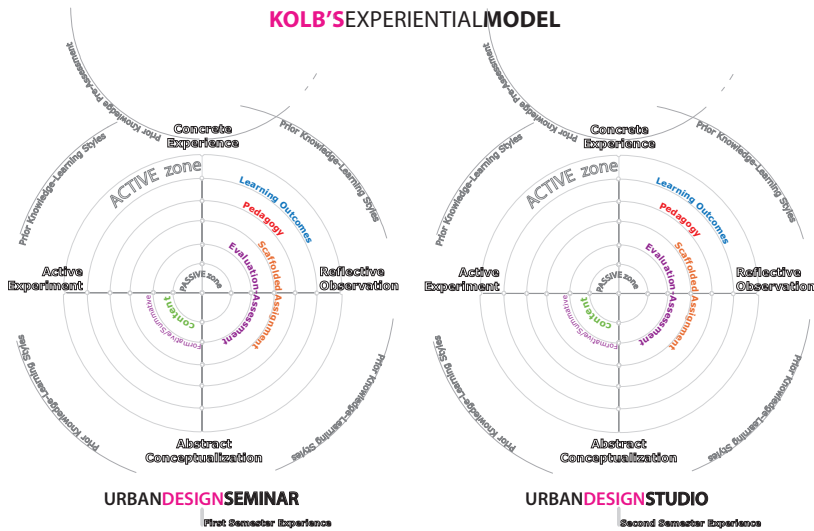
KOLB'S EXPERIENTIAL **MODEL**

URBAN**DESIGN**SEMINAR
First Semester Experience

URBAN**DESIGN**STUDIO
Second Semester Experience

Figure 4: The figures show multiple important elements considered in this integrative course design experience. The subsequent figures in the paper will expansively delve into the courses' details on these main elements and show how 'prior knowledge' is resourcefully engaged and how various learning styles are accommodated in course activities, assignments, and discussion. (Source: author 2010)

> (1) Each case or example of knowledge application typically involves the simultaneous interactive involvement of multiple, wide-application conceptual structures (multiple schemas, perspectives, organizational principles, and so on)... and (2) the pattern of conceptual incidence and interaction varies substantially across cases nominally of the same type … (Feltovich, Jacobson, & Coulson 1995: 92).

In "ill-structured" fields, "learner-centered (Weimer 2002)" instruction, including course development and syllabus design, should reflect the non-linear nature of the field. The course designs and syllabus are the first learning environments and elements students encounter. They serve as the initial steps and blueprints for future achievements, increasing their importance and the value of interactive designs, rhizomatic with multiple sophisticated connections to multidisciplinary knowledge and global perspectives. Sylvie Richards (2003) describes an interactive syllabus as a "learner-manipulated environment" wherein "concepts are presented in different ways and at different times" that result in "multiple and adaptive interpretations necessary for knowledge acquisition (Richards 2003:1)."

2-1- A MERGED PLATFORM: URBAN DESIGN CURRICULUM BASED ON KOLB'S MODEL

This section provides a concrete and cognizant syllabus framework adaptable to multidisciplinary and broad-scoped urban landscape design project topics. The merging platform of this combined seminar-studio is unique given that its experiences are backed up theoretically by being designed into Kolb's model (Kolb 1984). The course model explores how Kolb's experiential learning and its cognitive processes are "learner-centered" concepts that can accommodate various learning styles and enhance studio learning (Figure 4).

As illustrated in Figure 4, the two integrated courses are designed in a way to engage students in both 'active' and 'passive' modes of learning, when appropriate, by using a mixture of both 'hands-on' and 'minds-on' experiences. This adaptation of Kolb for urban design education also emphasizes 'Prior Knowledge' as an important element to be acutely considered and planned for in juxtaposition with the course learning. It is advantageous to assess students' earlier knowledge on methods, theories, and design approach in the beginning of the course. It is also helpful to organize a Learning Style Inventory prior or within the first session in order to identify students' learning preferences.

A students' transparent understanding of a course process through the syllabus can improve learning by justifying why the tutors do what they do and rationalizing the ways in which they do it. Knowledge acquisition in design studio can predominantly occur via transformation of student experiences as they are consciously constructing their own approach to learning. This transformation, as Ramsdan argues, should happen "as a process of working co-operatively with learners to help them to change their understanding (Ramsden 1992:114)."

2-2- A COURSE DESIGN COMPREHENSIVE MODEL

The framework offered in this paper provides one application of Kolb's theory to design education. The following (Figure 6 & 7) comprehensive illustration of the two design courses, seminar and studio, accompanied by detailed information regarding the important course design elements: syllabus, pedagogy and activities, learning outcomes, scaffolded assignments and formative and summative assessment techniques. This model visually communicates how all of the course elements and research-based principles of learning are integrated. Useful for teacher and student, this visual portrayal of the course design increases transparency and clarified the processes both embedded and expected that lead to deeper quality learning. Research shows that one of the most discussed frustrations of architectural design students, in particular, within the studio setting, is the insufficiency or lack of advance, step-by-step knowledge that informs them about what should be done next, how to proceed, and what they should achieve by the end.

This paper argues that an explicit and transparent integration of Kolb's cycle into the course design can make the learning process clearer, more meaningful, cognizant, and perceptible for students. This improved meta-cognitive gain is highly indicative of increased transfer and application (Bransford 2000). In addition, this model of an integrated theory-design course supports building on prior learning to more advance and expert learning (Bransford 2000). Just as important, intentionally integrating the earlier seminar course learning into the studio reduces the time required on reading and making sense of the earlier abstract concepts and the theoretical foundation once inside the studio. Hence, more effective and productive time can be spent on the actual applications and implications of the previously learnt concepts. Within the Project-Based studio structure, Kolb's theory flexibly houses diverse instructional activities. Design projects can be defined based on both "accessible" and "remote" site type projects and a variety of relevant pedagogical strategies can be utilized to further advance the experiential learning experience (Figure 5).

In the course structure, the syllabus is the initial learning environment encountered by students and serves as an interactive instructional roadmap designed to maximize learning. The course design communicated in the syllabus through alignment with core teaching and learning philosophies and principles, can further emphasize deep, quality learning, active and interactive learning environments, and increase the transparency of learning processes, roles, and expectations. Furthermore, the subject matter of urban design by nature is complex, multidimensional, and open to interpretation. This nonlinear and ill-defined aspect of urban design must, therefore, translate into the course design and delivery in a way that engages the design of course content, materials, activities, and learning processes. The Kolb's Experiential Learning Model is the theoretical framework designed into this course syllabus and activities. According to David Kolb, a cycle of four processes must be present so that learning occurs most completely (1984). The course learning prompts and encourages critical thinking, challenging students to explore thematic questions such as: How would you design if your access to an urban environment and its people was geographically remote. How would you approach design differently/similarly if your admission to the understanding of a city and perception of its urban experiences could NOT be on-site and real, for instance, if it is challenged by socio-political isolations or natural or man-made disasters? What different means and resources would you use to glean "concrete" familiarity with the site, and what specific genres of representation would you draw on to communicate your ideas and ultimately guide decision and action?

The Urban Design studio complements theoretical learning of the preceding seminar titled "Didactics of Public Space and Urban Landscape: Reflection on Theory and Implication for Design." The studio centers on innovative approaches to the experience, analysis and design of socially sustainable urban public spaces. Place-making for people is the central theme. Although the realm of exploration
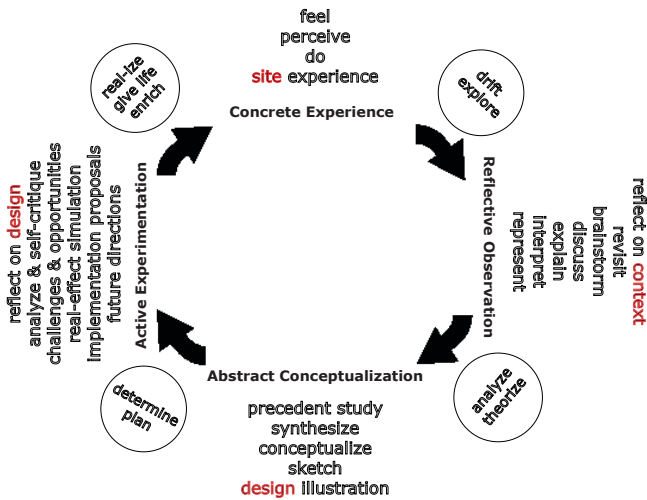
Figure 5: This figure shows how various instructional activities can be adopted into the studio's learning experiences based on Kolb. In a Project-Based urban design studio format, assigning two different types of project topics are possible: either ACCESSIBLE, on a national or local scale, or REMOTE or inaccessible, on an international scale. Because the earlier seminar course learning is integrated into the studio, a reduced time is spent in the studio to read and make sense of abstract theoretical foundation. Therefore, more time can be spent on actual applying and exploring the implications of the previously learned concepts. (Source: author 2010)
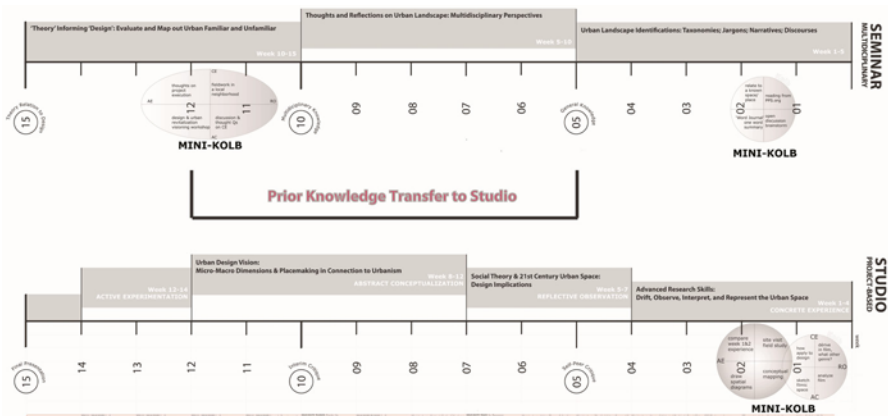
Figure 6: This experientially-rich, dynamic, and multidisciplinary studio course syllabus, developed based on Kolb's model, is coupled with the previous knowledge from the seminar to enhance students' learning. In addition, the 'prior knowledge' transfer is an essential design element. The design course is divided into four sections according to the Kolb's four pieces in the cycle. Kolb's experiential cycle provides a flexible tool for any pedagogy design. This holistic figure shows how Kolb's model can not only be integrated into the whole course learning experience, but also "Mini-Kolbs" can be designed into each session's (e.g. session 2 of the seminar in Figure 7) OR a combination of sessions' (e.g. sessions 10-13 of the seminar) learning activities. A note here is that a bigger scale course design poster, provided during the paper presentation session at ARCC 2011, gives a closer look at the design details. (Source: author 2010)

is global, the sphere of influence should remain local, working with actual site limitations and considering many discourses of marginality. "Place," in its fullest meaning, could not have existed without people. Not always unpretentiously submitting to their limited choices, offered by dedicated urban public spaces, people make places by their appropriations, discoveries, and contestations of spaces. The studio project should design for and embrace "people's appropriations, discoveries, and contestations." In the design of the two courses, students learn to draw on the knowledge from multiple disciplines to explore the urban context. In addition, they learn, through the course experiences and processes, to use alternative visual and other-than-visual representation mediums to create design visions.
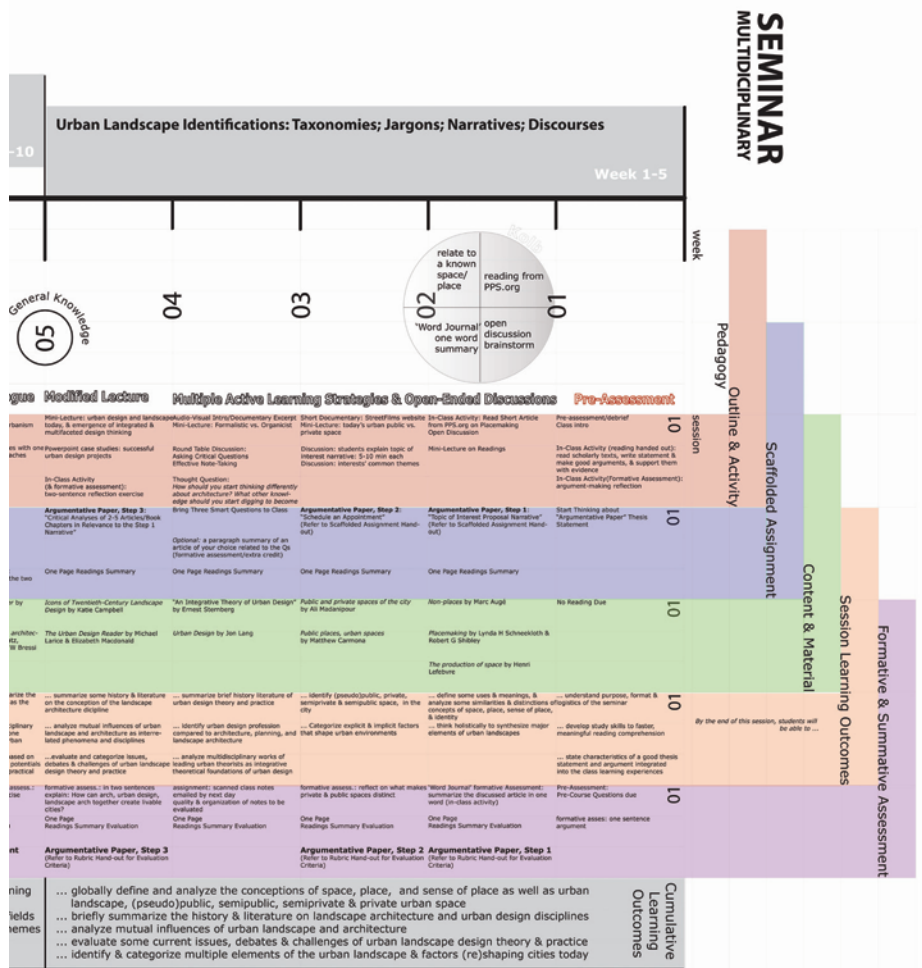
Figure 7: This is a closer view to how "Mini-Kolb" strategy is applied to the session two of the seminar and how this session's experience is worked systematically into the learning experience of the first five sessions. The bottom gray strip shows collective learning outcomes for these five sessions. The breakdown of these into session learning outcomes in the orange strip reveals the necessity of a back-and-forth process to constantly (re)think how the individual and collective are complementing and enhancing each other. A note here is that the big scale course design poster shows the remaining sessions design in more detail. (Source: author 2010)

Advanced Research Skills:
Drift, Observe, Interpret, and Represent the Urban Space

Week 1-4
CONCRETE EXPERIENCE

04   03

CE

AE

02 — compare week 1&2 experience | site visit field study

draw spatial diagrams | conceptual mapping

01 — how apply to design | dérive in film, what other genre?

sketch filmic space | analyze film

RO

AC

1: ACCESSIBLE site
make the familiar unfamiliar   **2: REMOTE site**
make the unfamiliar familiar

week

Pedagogy

Outline & Activity   Scaffolded Assignment   Content & Material   Learning Outcomes   Formative & Summative Assessment

Session

Figure 8 table content (by session 01, 02, 03):

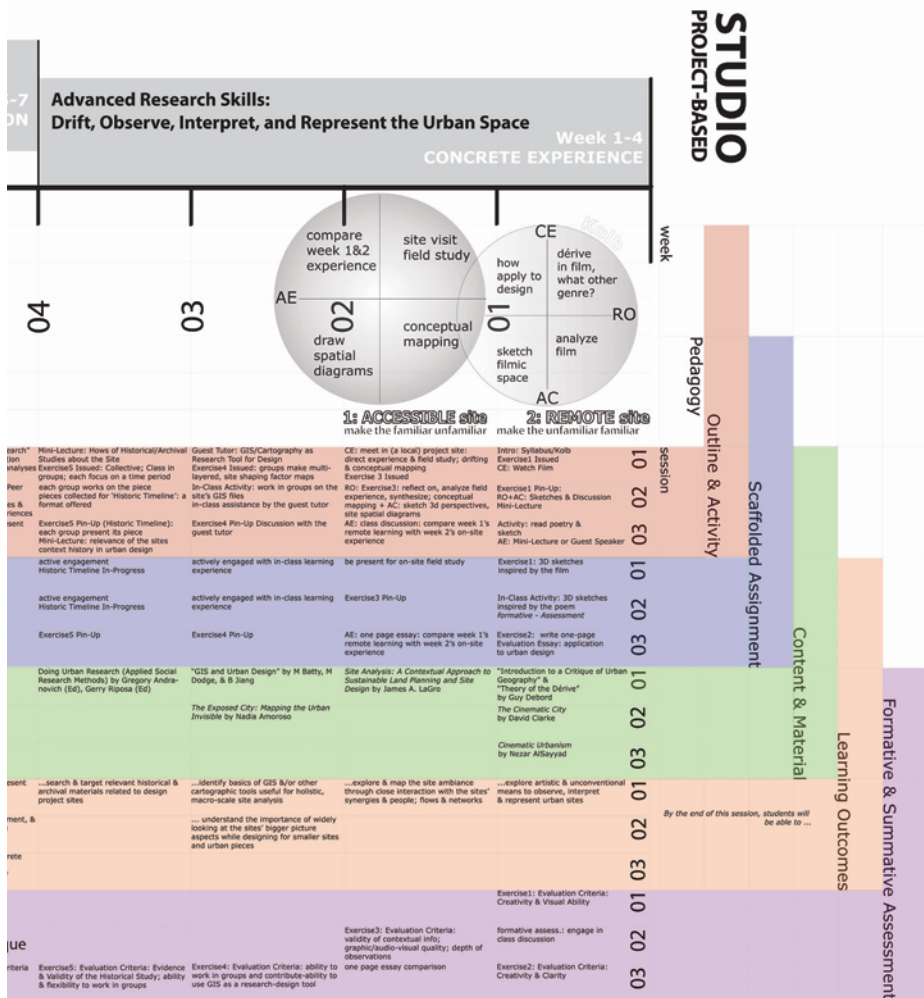|			
Mini-Lecture: Hows of Historical/Archival Studies about the Site Exercise5 Issued: Collective; Class in groups; each focus on a time period each group works on the piece pieces collected for 'Historic Timeline'; a format offered	Guest Tutor: GIS/Cartography as Research Tool for Design Exercise4 Issued: groups make multi-layered, site shaping factor maps In-Class Activity: work in groups on the site's GIS files in-class assistance by the guest tutor	CE: meet in (a local) project site: direct experience & field study; drifting & conceptual mapping Exercise 3 Issued RO: Exercise3: reflect on, analyze field experience, synthesize; conceptual mapping + AC: sketch 3d perspectives, site spatial diagrams	Intro: Syllabus/Kolb Exercise1 Issued CE: Watch Film Exercise1 Pin-Up: RO+AC: Sketches & Discussion Mini-Lecture
Exercise5 Pin-Up (Historic Timeline): each group present its piece Mini-Lecture: relevance of the sites context history in urban design	Exercise4 Pin-Up Discussion with the guest tutor	AE: class discussion: compare week 1's remote learning with week 2's on-site experience	Activity: read poetry & sketch AE: Mini-Lecture or Guest Speaker
active engagement Historic Timeline In-Progress	actively engaged with in-class learning experience	be present for on-site field study	Exercise1: 3D sketches inspired by the film
active engagement Historic Timeline In-Progress	actively engaged with in-class learning experience Exercise3 Pin-Up		In-Class Activity: 3D sketches inspired by the poem formative - Assessment
Exercise5 Pin-Up	Exercise4 Pin-Up	AE: one page essay: compare week 1's remote learning with week 2's on-site experience	Exercise2: write one-page Evaluation Essay: application to urban design
Doing Urban Research (Applied Social Research Methods) by Gregory Andra-novich (Ed), Gerry Riposa (Ed)	"GIS and Urban Design" by M Batty, M Dodge, & B Jiang	Site Analysis: A Contextual Approach to Sustainable Land Planning and Site Design by James A. LaGro	"Introduction to a Critique of Urban Geography" & "Theory of the Dérive" by Guy Debord
	The Exposed City: Mapping the Urban Invisible by Nadia Amoroso		The Cinematic City by David Clarke
			Cinematic Urbanism by Nezar AlSayyad
...search & target relevant historical & archival materials related to design project sites	...identify basics of GIS &/or other cartographic tools useful for holistic, macro-scale site analysis	...explore & map the site ambiance through close interaction with the sites' synergies & people; flows & networks	...explore artistic & unconventional means to observe, interpret & represent urban sites
	... understand the importance of widely looking at the sites' bigger picture aspects while designing for smaller sites and urban pieces		By the end of this session, students will be able to ...
		Exercise3: Evaluation Criteria: validity of contextual info; graphic/audio-visual quality; depth of observations	Exercise1: Evaluation Criteria: Creativity & Visual Ability
Exercise5: Evaluation Criteria: Evidence & Validity of the Historical Study; ability & flexibility to work in groups	Exercise4: Evaluation Criteria: ability to work in groups and contribute-ability to use GIS as a research-design tool	one page essay comparison	formative assess.: engage in class discussion Exercise2: Evaluation Criteria: Creativity & Clarity

Figure 8: To show the flexibility of Kolb's model, studio sessions one and two looks at how the model can be appropriated for an urban design project with a "remote site" or one with an "accessible, local site." (Source: author 2010)

EPILOGUE

For a 21st century architectural education, changes in design teaching culture is needed to match pace with other societal and cultural learning transformations. Design pedagogy is a cognitive as well as physical process for which design studio is the main forum. To enhance learning experiences and better educate the future designer, opportunistic inquiries should emerge that investigate innovative approaches to course and syllabus design. Therefore, multidisciplinary cognitive frameworks should be applied to bridge the two interdisciplinary domains of 'education' and 'architecture.' As Salama and Wilkinson argue:

Despite the tremendous changes in all aspects of life including architecture and urbanization, the current approach of teaching design continues to follow principles, rules, and practices developed in

the past where the influence of Beaux-Arts and Bauhaus models is still dramatic. Research indicates that designers in the academia will distance themselves from the real worlds, still barricade themselves from real human problems, while missing the opportunity to learn from the richness and depth of human experience (Salama & Wilkinson 2007: 4).

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