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Crafting Intimacy: Sculpting the Design Process of the Architecture Student

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Abstract: In his book Cube, David Morrow Guthrie discusses the role of abstraction or representation as the typical means of generating design in an architectural studio. For him, these constructs remove the maker from the immediacy and intimacy of the built architectural work. In addition, when these representations are made primarily by using Building Information Modeling or Computer Aided Drafting software, students have a tendency to have a constrained process in developing their design projects because of the limited ways in which they interact with the software. These projects often have narrow scope and conceptual basis and, at worst, are only designed as the software or the student's understanding of the software will allow. To combat this trend, the studio environment needs to be re-invigorated through the implementation of alternate strategies that allow the students to engage in the design process more intimately. As a response to these thoughts, one strategy for stimulating the architectural studio is the introduction of full-scale building materials as a primary medium for the generation of conceptual design. This approach forces the student to engage in the more intimate process of 'critical making' and provides a disconnect from digital representation and a focus on the realities of the built world. A study of select studio work from a recent course reflects the integration of these practices and their impact on the design process of the participating students.

Keywords: Critical Making, Making, Architecture, Intimacy, Abstraction, Representation

INTRODUCTION

> Knowing is a process, not a product.[1]
>
> -- Jerome S. Bruner, *Toward a Theory of Instruction*

Intimacy is defined, in general terms, as a close association with or detailed knowledge or deep understanding of a subject.[2] Within the practice of architecture, however, intimacy can take on many roles and fulfill many definitions. This term, for the architecture student, specifically plays two crucial, but disparate, roles: developing a deep understanding of the places we make and of the processes we use to make them. In the practice of architecture, we strive to create designs that allow for meaningful interactions to occur between the place and the inhabitants of that place. Although this mindset should be a critical focus in any typical architectural design studio, more important perhaps is providing a studio environment that allows for the design student to begin developing a deeper understanding of the materials and processes that are used to physically build architectural work. Both of these vital learning objectives provide architectural students with different understandings of the role of intimacy in the practice of architecture.

[1] Jerome S. Bruner, *Toward a Theory of Instruction* (Cambridge: Belknap Press, 1966), 72.
[2] intimacy. Random House Dictionary, *Dictionary.com Unabridged*. http://dictionary.reference.com/browse/intimacy (accessed: December 26, 2011).

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In contrast to intimacy, abstraction is defined as the act of considering something as a general quality or characteristic, apart from concrete realities, specific objects, or actual instances.[3] The practice of architecture is rooted in the generation of abstractions. From sketches on a roll of trace to photorealistic renderings, from conceptual massing models to the final set of construction documents, in the prototypical architecture office everything generated is an abstraction of a typically yet-to-be-built physical environment. This practice of generating abstractions also proliferates in the academic architectural design studio, forming the foundation of the design knowledge of most architectural students. Herein lies the core of this examination of how the practice of architectural design is currently taught. If the goal is to create an intimacy between the inhabitant and the place, why does this practice almost entirely center on the creation of abstractions which circumvent tangible connections to concrete reality? More importantly, why are students, who should be developing deep connections to how and why we build, working solely with abstractions that exclude them from this process?

The architectural design studio provides the core educational environment for most schools of architecture and it is here that students not only learn how to fundamentally design a piece of architecture, but also how to develop their own processes toward approaching design problems. These processes will most likely drive the quality and depth of their design projects both in school and as they move into the professional world. Within these processes, students cultivate their architectural "voice," their ability to think systemically about architecture, and their aptitude for creating intimate connections between the built form and the public. It is critical during this developmental stage that the design studio is constructed to allow students to engage with their projects in a variety of ways and through a variety of mediums. While certainly an intimate condition in its own right, a design process that utilizes only a single tool as the primary means of creating architecture has the ability to significantly limit the amount of engagement a student has with the project. While in school, students have to develop the ability to look at a project through different lenses and from different perspectives in order to generate a depth and breadth of understanding. Rooting a design process solely in a single tool, such as the computer, complicates the student's ability to make these deeper connections by limiting their ability to access the broad range of qualities innate in any design.

This paper poses an augmentation to the design studio as one alternative to re-invigorate this environment for the students and to provide a framework for students to succeed at connecting with their projects on an intimate level. This alteration involves asking the students to explore through a process of "critical making" and the introduction of full-scale building materials into the design studio as a primary medium for that exploration; a strategy that fosters tangible contact with the materials of construction and, in turn, tangible contact with architecture.

Intimacy

> I confront the city with my body; my legs measure the length of the arcade and the width of the square; my gaze unconsciously projects my body onto the façade of the cathedral, where it roams over the mouldings and contours, sensing the size of recesses and projections; my body weight meets the mass of the cathedral door, and my hand grasps the door pull as I enter the dark void behind. I experience myself in the city, and the city exists through my embodied experience. The city and my body supplement and define each other. I dwell in the city and the city dwells in me.[4]
>
> -- Juhani Pallasmaa, *The Eyes of the Skin*: *Architecture and the Senses*

[3] abstraction. Random House Dictionary, *Dictionary.com Unabridged*. http://dictionary.reference.com/browse/abstraction (accessed: December 26, 2011).

[4] Juhani Pallasmaa, *The Eyes of the Skin*: *Architecture and the Senses* (Great Britain: John Wiley & Sons, 2007), 40.

In the above quote, Juhani Pallasmaa depicts an active encounter with the city. He animates the city, humanizing it, and elucidates the potential for intimacy that is latent in our built environment. Intimacy has been focused here from the earlier definition to that of a deep understanding of place, form, and space derived through the generation of haptic and sensory connections with our surroundings. The city and the person, in this reading, are essentially seen as fundamentally neutral entities that achieve life through an interactive, symbiotic relationship. Until a door handle is touched, it is not intimately understood. Is it cold; is it smooth; is it heavy; is it hard to turn? The encounter between the object and the participant allows for those qualities to be more clearly grasped by this individual. Within this short paragraph, Pallasmaa's notions of our multi-sensory environment are evocatively captured and expressed in a simple premise: the more senses that we involve in our experience of space, the more intimate the encounter can become. Pallasmaa goes on to state that our visual perception collaborates with the sense of touch and the other senses to strengthen our understanding of space through a constant and differing interaction with it.[5] Close association with architecture, however, is typically anything but a conscious act because of our relative inseparability from the built environment.

This constant relationship with architecture illuminates the need for a similar level of intimacy between the architect and the design as that which would occur between the user and the building. A door handle can welcome, but it can also aggravate. The design of architecture is the generator of the potential for our interactions with it, be they positive or negative. In order to be able to design our intimate surroundings with care, architecture students must first learn how to form deep understandings with their own work in the design studio. Most professional architects and educators who have spent some time around a school of architecture may note that frequently the architectural design studio is conceived as an approximation of the architectural office. Perhaps instead of creating an artificial working environment, the design studio should alter its course and instead attempt to instill a culture of intimacy that is inspired by the interactions sought out between the built environment and its inhabitants. The studio environment needs to emphasize investigations that include the haptic and the sensory qualities of architecture, so, like in our experience of the environment, a depth and richness has the potential to surface. There is an embodied intimacy present in the materials of architecture. They have texture, scent, visual qualities, and auditory possibilities. They can feel warm, hard, rough, or slippery with or without us present. It is bringing this set of sensory qualities to the surface and immersing the students in them that allows for this type of intimacy, which is critical to the creation of space, to occur.

Abstraction

> Architecture is always concrete matter. Architecture is not abstract, but concrete. A plan, a project drawn on paper is not architecture, but merely a more or less inadequate representation of architecture, comparable to sheet music. Music needs to be performed. Architecture needs to be executed. Then its body can come into being. And this body is always sensuous.[6]
>
> -- Peter Zumthor, *Thinking Architecture*

In *Thinking Architecture*, Peter Zumthor brings to light his view of architecture. Above, he makes a comparison between music and architecture: neither exists without the execution. Neither the black dots on a page of sheet music nor the lines on an architectural construction document have any substance until someone interprets their embedded meaning and brings life

[5] Pallasmaa, *The Eyes of the* Skin, 41.
[6] Peter Zumthor, *Thinking Architecture,* 2nd *ed.* (Boston: Birkhauser, 2006), 66.

to these abstractions. Zumthor states that all ideas lie only in the physical manifestations of our abstract creations. For him, architecture is the "concrete body" that we inhabit for we do not dwell in an abstract world.[7] The intimate connection to this concrete reality that we occupy everyday provides the framework for our experience. Martin Heidegger expounds on this notion in *Building Dwelling Thinking*: "The relationship of man to places and through places to spaces is based on his dwelling in them."[8] And yet, out of necessity, abstraction dominates the practice of architecture.

In his essay "The Representation of Construction," Sam Ridgway defines representation as "the presentation of one thing (the signified) in or by another (the signifier). One thing is presented again in another."[9] By this definition, architects indeed do not make anything concrete. They do not create the spaces we dwell in; they create drawings that are at the same time representations of the building yet to be built and abstractions of the dwelling that has occurred in thought as the project was conceived. Contractors, in turn, build a physical structure that is a representation of the set of drawings produced by the architect.[10] Although not so at all points in history or currently at all places on the planet, in contemporary society, it is typically only through this series of abstractions that architecture comes into being.[11] And it is within this framework of representation that we must educate future generations of architects.

These notions of abstraction become more complex when you examine the current role of technology in its generation. Each new iteration of design software allows architects, and in turn students, to investigate more complex building forms and more involved construction techniques while developing more refined knowledge of how the building should perform prior to a single brick being laid. As this level of control and understanding grows, Ridgway warns that although architectural software like building information modeling (BIM) programs are valuable tools that create a database of all of the physical and non-physical data in a project, the notions of control that they and other "design" software provide have the dangerous ability to push critical architectural design issues like the qualities of the space we inhabit and other properties of buildings that can remain invisible in a set of construction documents to the background.[12] According to Alberto Perez-Gomez, the typical set of construction documents is now required to be completely unambiguous and, resultantly, they are "neutral instruments devoid of inherent value other than their capacity for accurate transcription."[13] Although not limited to documentation generated by the computer, the elimination of the hand of the architect and its ability to subtly embed spatial quality and the rising expectation levels regarding the absolute precision of the computer have magnified the issue. As the abstraction of the building from which the architecture will be built, these construction documents, rich in constructability and void of intangible quality, have the potential to transfer their neutrality directly over to the architecture itself. There is an additional risk to the architectural student in that as their primary goal should be focused on the process of design rather than the final product, the precision of the computer may not best serve the exploration of design and architecture that they most critically need.

In order for an architecture student to begin to understand how to create architectural design, he or she must be able to clearly understand the ramifications of designing within a construct of abstraction: what does each line drawn on the paper mean in the real construction of the work? David Morrow Guthrie states in his book *Cube* that in the design studio, as well as in

[7] Zumthor, *Thinking Architecture*, 37.
[8] Martin Heidegger, *Poetry, Language, Thought*, trans. Albert Hofstadter (New York: Harper Collins Publishers, 2001.), 155.
[9] Sam Ridgway, "The Representation of Construction," *Architectural Theory Review* 14, no. 3 (2009): 268.
[10] Ridgway, "The Representation of Construction," 268
[11] For a more in depth discussion of the notions of representation over the course of the history of building see Sam Ridgeway's *The Representation of Construction*, 2009.
[12] Ridgway, 277.
[13] Ridgway, 269. – excerpt taken from Alberto Perez-Gomez, *The Poetic Origins of Architecture*.

many other courses in a typical school of architecture, the students deal solely with abstractions. Everything that is generated refers to something else and only very rarely is anything actually produced with a tangible and physical reality. For most students, their entire education regarding the creation of architecture involves no actual constructing of architecture. This reality limits the students' access to critical notions of scale and materiality and blurs the students' understanding of the physical consequences of their decisions.[14] Although abstraction cannot be removed from the architectural design process, it can be focused differently to allow students to explore the haptic and the sensory experiences of architecture through the investigation of the materials of construction.

Critical Making

> As fundamental as it seems to architecture, confronting material reality is typically not a priority. It is either not recognized as essential to architecture, or just plain difficult to approach. With the apparent triumph of the image, the idea of studying material relationships almost seems anachronistic and esoteric, even irrelevant. Easily subsumed and obscured by other legitimate issues that are more readily accessible through conventional analytical and representational tools like drawings, the tangible consequences of architectural decisions often become an afterthought.[15]
>
> -- David Morrow Guthrie, *Cube*

Almost all architecture studios involve various forms of making as requisite components to fulfilling the requirements of the course, but frequently the making that takes place in these studios is solely focused on generating a representation of the design that has already been established through drawing, sketching, computer rendering, and the like. Some of these studios only use these physical manifestations of the design to present the project for review; others use them to allow the students to study their ideas in a three-dimensional state. Few, however, engage in a process of critical making as a way of generating design ideas and exploring the qualities of material and space.

Matt Ratto, in his essay "Critical Making: Conceptual and Material Studies in Technology and Social Life," describes critical making as the connection between the conceptually based practice of critical thinking and the physical, goal-based practice of making. For him, critical making "emphasizes the shared acts of making rather than the evocative object."[16] The notion of critical making centers on a more intimate connection with the subject as a tangible reality. It is about touching the material, feeling its form, and reshaping it into an idea. It is about developing an intimate relationship with the physical world and using that relationship to inspire design. Matthew Crawford, in *Shop Class as Soulcraft*, extends the reach of critical making by channeling Martin Heidegger: "the way we come to know a hammer is not by staring at it, but by grabbing hold of it and using it."[17] The experience of critical making for an architecture student can, therefore, have a second advantage. By encouraging designing through making, the architecture student is far more likely to understand the actual processes involved in creating the architecture that he or she will design throughout his or her career. If one has poured and troweled concrete through a process of critical making, he or she should come to acquire a more intimate understanding of how that same type of material will be placed in the built en-

[14] David Morrow Guthrie, *Cube* (New York: Princeton Architectural Press, 2005).
[15] Guthrie, *Cube*.
[16] Matt Ratto, "Critical Making: Conceptual and Material Studies in Technology and Social Life," *The Information Society* 27, no. 4 (2011): 253.
[17] Matthew B. Crawford, *Shop Class as Soulcraft: An Inquiry into the Value of Work* (New York: Penguin Books, 2010), 164.

vironment. A more intimate knowledge of the material will allow for a much stronger and appropriate use of it in the future. Critical making employed as a primary component of the process of design takes the emphasis away from the object and the representation of that object and places it on the process of generating ideas through the use of multiple senses. Referring to Pallasmaa's notions of intimacy, as students engage their ideas about architecture with an interaction that reaches beyond the visual, they will have the ability to begin to understand the ramifications of their decisions more clearly.

With these goals, this design studio utilized critical making as a means of directly engaging the students with the design process. The intent of the studio was not to remove abstraction or the computer from the course, nor was it to somehow artificially manufacture intimacy between the students and their work, neither of which is practical nor even possible. Instead, the intent of the studio was to create a construct in which the opportunity for a relationship between the students and the materials of construction, the work, and the interaction of the public with architecture could arise. The hope in this was that by approaching a design problem from a more complex series of trajectories, the students would have the ability to establish more haptic and sensory understanding of the built environment.

The studio was setup as two tracks running the full length of the semester that the students worked through concurrently. The first track followed a very typical studio trajectory, beginning with a case study and then program and site analysis, followed by the primary design problem of a small community arts center. The second track, however, provided an entirely different conceptual framework from which the students could engage the problem. This track pushed the students through a series of critical making exercises involving full-scale building materials that were inspired by building exercises established by David Morrow Guthrie at Rice University and outlined in his book *Cube*.[18] The two tracks constantly informed each other throughout the course of the semester, bridging critical making with traditional research and design and vice versa. Along with the ideas of critical making, this structure fostered student engagement with the project through multiple mediums and through different thought processes in an attempt to maximize the potential for a successful learning experience.

The first phase of the critical making process asked the students to develop 16"x16"x16" full scale constructs out of given materials while establishing a design concept about the relationships of the individual elements, the parts to the whole, and the spaces created within the cube. It is important to note that their designs were not models, but full scale constructions; they were not representations of anything larger or more "real." Although abstraction was not completely removed from the process, this fundamental shift from creating a representation of something else to creating the object itself forced the students to fully resolve the entire design; at no point in the cube could an unresolved element be hidden or disguised. Also, although in the first track the students were using the computer to generate analysis presentations and to do site mappings and studies, in this second track, the computer was not allowed to be used except at very specific moments to generate documentation of the constructions and minimal presentations of the ideas. This limitation along with an accelerated timeframe, forced the students to jump right into the making process. There was no time available to sit and ponder their ideas. They had no choice, but to quickly begin to engage with the materials and the process of making and learn to generate ideas through exploration and experimentation.

The critical making track centered on the development of a series of these cube constructions. Each cube was built using only their sketchbooks, the raw materials, and the tools in the shop. There were four generations of cubes built by the students. The first generation had to be built using only 2x4s as an exploration of a construct of lines (figures 1–3). The finished construction was required to demonstrate the qualities of wood, the perception of the construct of lines, and to exude the essence of the design thesis. The second generation built on the conceptual ideas

[18] Guthrie, *Cube*

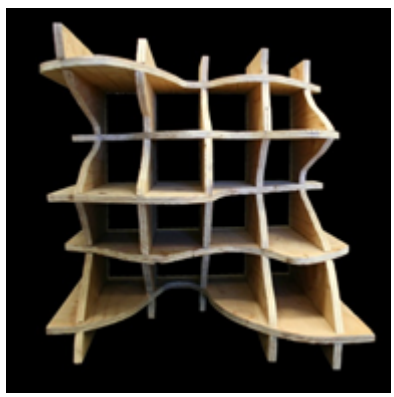
of the first, but transitioned the construct to planes, using 1/2" plywood sheets (figures 4–6). The third continued this process utilizing a construct of mass and a material of concrete (figures 7–9) and the fourth combined a new material of fabric with any one of the previously use materials in a construct of interaction (figures 10–11). Each generation was built twice prior to moving on to the next and each was fully diagrammed to graphically illustrate the conceptual ideas embedded within each construction. This rigorous process resulted in each student designing and building eight self-contained architectural constructions in about a six week period at the beginning of the semester. At the conclusion of these exercises in critical making, the students once again pulled out the conceptual ideas, but this time the transition was to the site and to the building project housed in the first track.

1: Cube 1–line (d. yu)

2: Cube 1–line (m. bartschi)

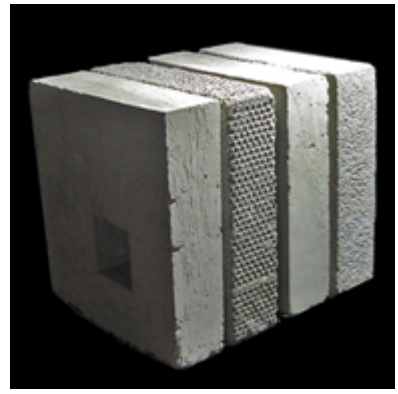
3: Cube 1–line (j. far)

4: Cube 2–plane (j. far)



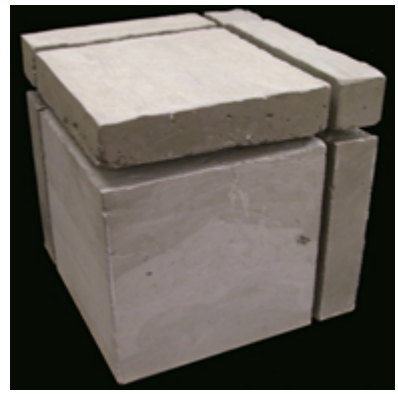
5: Cube 2–plane (d. yu)

6: Cube 2–plane (j. brookbank)



7: Cube 3–mass (k. griggs)

8: Cube 3–mass (j. brookbank)



9: Cube 3–mass (m. bartschi)

10: Cube 4–combination (k. griggs)

11: Cube 4–combination (d. edwards)

When Peter Zumthor discusses the work he does in his studio, he describes it as making concrete things. He designs first through making, using the materials of building, not the materials of modeling.[19] While these exercises in our class appeared to be very simple at first to the students,

[19] Zumthor, *Thinking Architecture*, 66–67.

they soon realized that in order to design the fully realized construction, every joint and every intersection had to be contemplated at the same level. Like in Zumthor's studio, the relationship my students developed with these constructions far exceeded any relationship they would have had with a model of a building assembled with chipboard, basswood, and glue. As they, at least momentarily, stepped away from the virtual environment and from representation as a primary means of conveying ideas; each student embraced the alternate viewpoint of design and construction and began, on some level, to develop a more intimate understanding of the materials of construction. Here the work began with the tangible reality as opposed to beginning with the abstraction of the plan, reversing the trend of the vast majority of studio experiences and providing the students with a broader spectrum of proficiencies to move forward with in their education and their profession.

Conclusion

> In sailing, one is always aware of the dependency on the wind; in architecture, one is always aware of the dependency on the qualities of building materials, and on the skill of builders. Sailors may utilize many sophisticated techniques as long as they do not lead to the illusion of domination over the wind and water. Architects and builders may adopt high-tech solutions intended to make their practices more efficient, providing they do not succumb to the illusion that these techniques grant the domination over substances, spaces, and lives.[20]
>
> -- Daniel Willis, "The Impact of the Computer on Architectural Practice"

This paper is not a call to arms against the computer and it is not about educating a person on how to have an intimate connection with architecture. This paper simply puts forth one of many potential avenues to explore in helping architectural students more fully engage with their work, their ideas, and the built environment. The quote above is a short excerpt from a longer discussion from Daniel Willis in his essay "The Impact of the Computer on Architectural Practice" regarding the relationships between the practice of sailing and the practice of architecture. In sailing, a small group of human beings take on the forces of Mother Nature: the driving wind and the rolling seas. With technology on their side as a valuable tool, these individuals are given the chance of success in dancing with the elements. In architecture, students or professionals can use the computer or any other individual tool to create magnificent spaces, but without critical response to the place, the material, and the people who spend their lives within, the effort has the potential for ultimate failure. It takes a multiplicity of tools to allow a student learning how to design to make deeper connections to architecture, connections that in some respect define what architecture is. *We dwell in the city and the city dwells in us*.[21]

The architecture student faces a very different challenge than the architect. Learning what needs to be done when you become an architect is an entirely different challenge than doing what needs to be done when you are an architect. Architecture students need to learn through an immersion into and a deep connection with a design problem; they need to explore it in different ways and through different means in order to establish a more thoughtful connection with their subject. By engaging in a process of critical making, students have the opportunity to develop a more intimate relationship with materials, explore processes of construction, and understand how users, most notably themselves, interact with architecture. When used in concert with other means and modes of exploring design, such as the computer, this framework for

[20] Daniel Willis, "The Impact of the Computer on Architectural Practice," in *The Emerald City and Other Essays on the Architectural Imagination*. ed. Willis (New York: Princeton Architectural Press, 1999), 275.
[21] This line is a reference to the earlier quote from Pallasmaa, "I dwell in the city and the city dwells in me."

thinking about architecture has the potential to develop and provide a student with more than just a final project for the semester, but with a more intimate connection to the built world.

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Images provided by select students from the course: Mark Bartschi, James Brookbank, David Edwards, Jamy Far, Kayla Griggs, and David Yu.

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