Processes in Digital Design:

A Phenomenological Threshold for Curriculum Development in Digital Design

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The primary intention for this essay is to focus on the role of spatial experience as a generator for activity within the digital design studio; specifically at the foundations level. The subject course, which will be referred to as the *Digital Design Studio,* is intended to be taught in conjunction with second year architectural design studio courses within one current architectural design program; acting both to support and extend the design curriculum agenda in operation within that program. The Digital Design Studio is scheduled to be offered for the first time in the 2010 spring semester.

The course is designed to be responsive to ongoing events in the state of digital design, and the threshold between course criteria and implementation is significant because this is the moment where the true identity and direction of such a course will be defined. Within this threshold, a decidedly experiential matrix of problem statements will be the generators for research and solution proposals responsive to current activity within the digital design and fabrication field.

Design and Phenomenological Inquiry

To begin a discussion about the design of digital-architectural curriculum may in the very naming create an exclusionary bias toward that which is not "digital." Such an occurrence would leave out a major portion of the equation regarding the design of architecture, which is the experience of architecture. The focus of this essay is to reveal that the current nature of digital design processes is inextricably linked to the understanding of spatial experience and is rapidly becoming part of a widespread social, cultural, and technological identity (Kolarevic, 2003).

Processes in digital design must therefore be treated as a fully engaged sensory component in the experience of space.

The notion that one may adapt an experiential or phenomenological method to the development of new processes in the current advanced state of digital design technology may seem implausible to some; however, phenomenology is a branch of philosophy which is founded in scientific rigor (Lauer, 1964, p. 4) and is one which focuses attention on precisely the experiential processes which generate the need and desire to organize and structure daily social / spatial interactions.

The work of Edmund Husserl, a philosopher widely known to be a primary founder of this philosophical branch, was understood to include the contention that phenomenology is the only truly scientific branch of philosophy where cognitive certainties might be addressed (Lauer, 1965, p. 5). Such a position is generally supported by the focus in phenomenology on a reductive analytical process, leaving only that which is certain in experience and leaving out that which is added by means of definition outside of direct experience (Smith & Smith, 1995, p. 11).

The Digital Designer

To smell a flower on a sunny clear day is not an activity which requires digital interaction; however, the designer engaging in this activity today is one who does so within the context of a dramatically expanded communicative potential regarding such an event compared with the designer of only several decades past. This person is not only able to convey and expand upon this experience with enhanced communicative capabilities through digital technology, but also perceives and experiences such moments with knowledge of the mechanisms and abilities of a digital age. The experience is different now than it once was; the knowledge of what might become is ever-present within this moment.

The phenomenological method of *epochē*, or the deliberate suspension of knowledge through which one may derive certainty by means of a "clean slate" (Angeles, 1992), can not strip away this type of knowledge. The posture adopted with this essay places the current state of technological understanding as an inextricably linked identity within the realm of the current technological culture and places such an olfactory experience on parallel with Husserls idea about the *noetic* moment and the resulting *noetic-noematic correlation* (Smith & Smith, 1995, ch. 2). Consistent with this idea, two basic parts of experience are involved in the act of smelling the flower; one of those parts, for the contemporary designer at least, has taken on a new meaning in the context of knowledge in current technology. The intention to smell this flower or *noema* in phenomenological terms [not the social act, but the pure essence of intent to fill the olfactory senses with fragrance] will be little changed from similar moments experienced in any time past. The "real content" (Smith & Smith, 1995, p. 22) [or *noesis*] however, or the essential moment of that experience [that which might be exposed or left through the reductive process of epochē], may be irrevocably altered from that which might have been experienced in the past due to the new and extended or altered identity of the "digital designer" as the result of an inherent knowledge of what this experience might become.

In terms of direct effect, the contemporary technologically aware and capable individual may still consciously let a flower be a flower. On a more basic level however; through reductive processes, this person may employ the "real content" of this experience, along with other experiences, and incorporate it into a field of knowledge for use in complex array of spatial communications.

The process undertaken to develop assignments and strategies for the digital design studio will examine the *noesis* or "real content" moments of experiential, environmental, or

spatial interactions using the reductive format of epochē to strip away that which is not essential in understanding these interactions. By means of then researching and assigning technological methods to mediate interaction between these moments and the fundamental spatial needs they represent, students may construct meaning within basic assignment frameworks which they are initially given. Inherent in this position is the idea that initial assignments will not explicitly identify specific problems or direct specific processes; rather the assignments will promote speculation about particular social / spatial conditions, and require both problem identification and solution generation by the student.

Current Design Studio Processes

A current architectural design studio model, the one with which this course will operate in parallel, adopts a similar philosophical posture. The parallel model, which will be referred to as the *Design Studio,* similarly uses deliberate suspension of knowledge as a means of arriving at a "clean slate" (Angeles, 1992), consistent with the process of epochē, previously mentioned. Following are portions of the syllabus introduction to one of the foundations design studio courses, Architectural Design I [ARC 1301]. Here the instructor, Jon Wenberg (2009) states:

> [ARC 1301]… will set the stage for developing a new way of seeing and understanding architectural design. The title of a biography on contemporary artist Robert Irwin: '*seeing is forgetting the name of the thing one sees'* (Weschler, 1982), connotes a contemporary move toward the idea that creative development may begin as a process of suspending and re-inventing conceptual boundaries…

The suspension of conceptual boundaries mentioned here is used specifically in this model of foundations level design studio education to promote new growth and individual processes in the communication of spatial ideas. Fundamental concepts such as scale and systems interaction are

addressed through a process which temporarily disallows the use of readily identifiable visual cues such as doors, windows, stairs, roads, and buildings, in the communication of the spatial concepts on which they are founded. The process requires a willing suspension of that which is already defined in order to promote the invention of new definitions and new processes whereby students may come to understand and become fluent in the visual language of these concepts. By engaging in this "abstract" or reductive method in the conception of spatial communication, students also begin to develop a new set of analytical tools with which to extract core essences of existing structures [both spatial and material] without the distraction of superimposed meaning.

The process of reduction used here is modeled on a deconstructionist idea about the importance of revealing the constituent components of a spatial experience so that it might be redefined in a constructive and new way (Wigley, 1993, p. 26). Along with the reductive process, an investment in re-assembly is made by means of constructing so as to reveal, by design, the very structural interactions exposed through reductive analysis. The design studio model also adopts methods in phenomenal transparency, as identified by Colin Rowe and Robert Slutzky. In their essay titled: *Transparency: Literal and phenomenal*, Rowe and Slutzky (1963) state: "Transparency means a simultaneous perception of different spatial locations" (p. 45), and "…it [transparency] may be an inherent quality of organization" (p. 46).

By means of promoting simultaneously the phenomenological processes of reductive analysis and this specific type of transparency, this design studio model allows students to develop new processes of re-examination which exceed the boundaries of traditional design studio models. The traditional models referenced are ones which often use style and form as a repetitive metaphor for experience; not unlike the repetitive types or unexamined stereotypes referenced by Mark Rakatansky regarding conventional spatial programming (Rakatansky, 1992,

p. 209). The process is precisely one which is intended to allow a new studio course in digital design and fabrication to exceed the boundaries and limitations of current process and trends in the field of digital architecture.

Approach

The primary question addressed here, in regard to the focus of a digital design studio, is about whether the study of spatial experience is leading new directions in digital design education or if digital technology is defining how spatial experience is addressed. Stated as a position regarding the digital design studio, the nature of current digital design curriculum should not become *a solution looking for a problem*.

From the outset, using a phenomenological approach to digital course design was desired. A rationale for the use of this philosophy absolutely involves it's inherently scientific and analytical potential (Lauer, 1964, p. 4). A basic requirement in this case is to develop a curriculum for digital design which operates in support of, and in conjunction with, current ongoing directions in the core studio design courses offered under the same degree program. The design studio model from which the digital design studio curriculum will be generated, as previously stated, has some clear though somewhat informal origins and commonalities in the work of Jaques Derrida and literary deconstruction, as well in the phenomenology of Edmund Husserl, whose work greatly influenced deconstructionist thinking (Wigley, 1993).

Because this is a decidedly phenomenological approach to digital design education, one must also confront potential student responses to a certain well known negative stereotype of deconstruction often identifying the philosophy as a destructive and nonsensical approach to architecture; and re-frame the idea as a scientific and methodical approach. Wigley (1993) states, "The unbuilding that is deconstruction is not a form of demolition. It establishes the conditions

of possibility of the ‘traditional architecture’ rather than staging its fall” (p. 42). Wigley also describes how deconstruction is tied to the ideas of Edmund Husserl regarding that which is “essential,” in that Derrida derives meaning in structure by understanding that breaking down or deconstruction of such structure reveals its meaning through the requirement to be translated or re-understood in a very immediate sense by the participant (Wigley, 1993, p. 26).

As a matter of practicality, students entering the new digital design studio should be briefed on the philosophical foundations of this approach and become willing partners in the implementation of such a methodology. Students should not be asked to suspend knowledge in any regard without understanding the reductive process to which that method of suspension belongs.

Process

In the design studio model with which the new digital design curriculum is aligned, there is often a deliberate resistance to the idea of codification in processes. Where a codified method might be useful in some fields, the design studio model places significant importance on the development of individual processes. The application of a scientific and philosophical method to this effort in curriculum development must therefore take queue from those methods; though should not allow those methods to be used in an attempt to codify any singular process. That said; a phenomenological process of reduction will be undertaken as a methodology in the definition of both problem identification and solution approach within this position.

Taking queue from the design studio model, the following process describes a form of *Transcendental Phenomenology* based in the writing of Edmund Husserl; and as stated previously, for the purpose not only of developing a reductive process but also to facilitate re-invention of that which is left by reduction in a new and meaningful way.

The use of Husserls transcendental methodology is deliberately addressed separately from the Heideggerian variation of *Interpretive Phenomenology* for the reason that the latter is positioned within this posture as a continuation of the Husserlian methodology (Rapport & Wainwright, 2006), and not as a rival parallel. The position that a Heideggerian approach represents such a continuation is a subject for some debate and may be addressed separately; however, the process of reduction or epochē is inherent in the design studio model, and is one which may be demonstrated to be effective in the goal of re-thinking conventional processes in digital design curriculum.

Method

In his 1958 book *The Triumph of Subjectivity: An Introduction to Transcendental Phenomenology*, Quentin Lauer addressed six stages in the application of Husserl's process in epochē (p. 51-58). This process, though compiled by Lauer from many sources within Husserl's writing over several stages in his career (Lauer, 1958, p. 51), may be understood as a working process already functioning within the design studio model.

The first stage is identified by Lauer (1958) as *Psychological Reduction* (p. 51), and may be understood within the context of design curriculum as the moment of intention to identify or engage in experience. The critical first stage in one of the foundations courses of the design studio method involves a conscious suspension of pre-defined queues to scale identification in the elimination of components such as doors, windows, stairs, buildings, and roadways in an effort to begin developing a spatial / material language which communicates spatial ideas absent of pre-defined language. The second stage, identified as *Eidetic Reduction* (p. 52), or formal / essential reduction, involves the act or "real content" of a moment where in a design studio problem one might decidedly consider the essence of an idea such as *Threshold,* aside from the

suspended notion that thresholds are often equated with the definition of "doorway." By engaging the eidetic reduction stage, the student has now entered a moment of pure individual interaction with the spatial idea. The third stage is identified as *Phenomenological Reduction* (p. 52-53), and marks the moment where reduction engages construction or re-definition. Because the definition of a spatial condition such as "threshold" is suspended and other possibilities made available for consideration, a new subject / object correlation may begin to unfold as a "datum of conciousness" (p. 53), enabling a new sequence of re-invention [the fourth stage]. In the fifth stage, the experiencing individual becomes a transcendent component in the construction of new objects. Lauer states that to know this function "is to know one which is transcendentally related to the objects which are its intentions" (p. 55-56). In the act of re-definition, the experiencing individual becomes an integral part of the construction. In other words, the spatial idea originally placed under analysis, ceases to be defined by outside influences and is re-defined as within the experience of the individual designer; new work is born from existing ideas. If stage two was the moment of conception, stage five is a moment of new birth. Stage six, as described by Lauer, involves developmental expansion or continued growth of what has been re-defined (p. 57).

As mentioned previously, the position taken here does not exclude an interpretive or Heideggerian component in this process. Interpretive phenomenology, and notions of the "hermeneutic circle" (Rapport & Wainwright, 2006), are viewed within this position as being relevant to the necessary continuation of the Husserlian stages.

The Digital Design Studio

Within the new digital design studio, project types are organized in such a manner as to build from generative or sketch format to constructive and fabricated reality. The following sections address course project categories such as 2-D Generative Graphics, 3-D Design, 4-D or

temporal experience, and Constructed Prototyping as listed sequentially in the digital design studio course syllabus. The individual projects are not enumerated in detail here, but are rather described in expanded terms of process, course objectives, and outcome expectations.

The primary course objective is that students develop a personal approach to digital design processes which are dynamic in the sense that such processes may grow or expand, as new design problems and technological advances add new options to the physical act of design and construction. What must not happen as the result of participation in a course such as this one is that a student embraces a process dependent on specific expressive and productive technologies which are available currently, but which will rapidly be surpassed as advances in technology unfold.

Course texts.

With the primary course objective in mind, the book *Architecture in the Digital Age: Design and Manufacturing,* edited by Branko Kolarevic, has been chosen as one course text for its process oriented overview of current digital design and fabrication processes. Though the Kolarevic text does provide essential and focused insight into non-linear process oriented views of current digital design modalities (Kolarevic, 2003, ¶3), some clear distinctions must be made between the approach proposed by this essay, and that of the Kolarevic text.

One clear distinction is that this essay proposes a conceptual and philosophical posture in the approach to digital design; what this essay does not do is to deploy technical leadership in the essential way which is primary to the Kolarevic text. The goal of this essay is to propose a fabric of interchange where cross disciplinary communication may occur and where new directions in digital design may develop. This essay is a proposal for interaction.

The posture sought here, is in agreement with Kolarevic where the idea that current processes promote the ability to generate construction information directly from design information (Kolarevic, 2003, ¶3). The posture deviates significantly from that idea however, where Kolarevic's focus seems to be on the transformation of form, and where this posture's focus is on the generation of spatial interactions which in turn may influence form. None the less, the success of this posture will lie in demonstrating the ability to both generate spatial ideas, and construct the forms and conditions which ultimately define them. To this end, the Kolarevic text and others like it will provide the bridge between philosophy and creation which is essential to development of the cross disciplinary interaction sought.

Complex visual communications.

As a first stage in method development within the digital design studio, a series of two dimensional visual communications may be constructed as a way to both become familiar with the reductive process, and as an initial part of continuing developmental processes in the communication of design ideas. Complex and visually communicative interactions may use a phenomenological modality to expose structural [spatial and material] interactions. As previously mentioned, Edmund Husserl wrote about the opening of structure as a revelation of the "essential," and Jaques Derrida derives meaning in structure by understanding that breaking down or deconstruction of such structure reveals its meaning through the requirement to be translated or re-understood (Wigley, 1993, p. 26).

Precedents for the use of complex visual communications may be seen in the work of contemporary artists where borrowed and constructed components are juxtaposed in such a manner as to break down or suspend the individual meanings of used objects and simultaneously allow new meaning to unfold in the experience of the observer. The contemporary artist Robert

Rauschenberg produced works he called "combines" using a collage and print method to form just such juxtapositions. Regarding Rauschenberg's process, Wescher (1968) states "…all that counts is the act of artistic creation by which reality is subjected to an ever-changing process of transformation…he developed new possibilities of representation from the basic principle of collage (p.310)."

As well, Kolarevic (2003) states: "…digital media is increasingly being used not as a representational tool for visualization but as a generative tool for the derivation of form and its transformation – *the digital morphogenesis." (p. 13).* Again, Kolarevic's focus on form is a departure point; however, the concept or tool of "morphogenesis" may be used as a focused component in the process of epochē or the process of reduction and ultimately re-definition as previously referenced.

3D and 4D constructions.

The step into 3-D and 4-D design, though initially sequenced as a second step within the course syllabus, should not be seen in sequential terms. All the categories of digital design and fabrication may become mingled in the development of an individual student's process. The step; however, should draw from the generative processes used in the 2-D section by first focusing on the spatial conditions and relationships identified in that process, and then beginning to generate formal responses to those conditions in full 3-D design. Kolarevic, in this regard, points to an integral part in the process of digital 3-D generation. Kolarevic (2003), states: "Instead of modeling an external form, designers articulate an internal generative logic, which then produces, in automatic fashion, a range of possibilities from which the designer could choose an appropriate formal proposition for further development" (p. 13). As long as the process itself does not become an exercise in automatic production, the process of transformation based on the

manipulation of “internal generative logic,” may also become a part of the whole process in epochē, the importance of which this essay has emphatically expressed.

In regard to 4-D constructions, or those which are used to address experience in time, these modalities must be used to go beyond the simple idea that a literal “tour” must be given through a 3-D environment. Though processes may use the tour as part of an experiential demonstration, the 4-D component of this course will be used both expositionally in terms of describing and documenting design processes, and as a tool for allowing the type of complex multi-scale experience as demonstrated through the “combines” of Robert Rauschenberg, which may in turn be used as a continuation of the generative process.

Fabrication.

As in the “design” components of the course, the fabrication component must also be treated as a process. Ultimately, structures may be built at full scale; however, with this being a preliminary course in design, no constructions will be considered final forms. Instead, throughout the sequence of the course, all physical products should be treated as stages in the development of each individual student’s process, which is the primary objective for the course. As in the parallel “design studio” referenced earlier, constructed projects will mostly be scale constructions of critical pieces or moments within larger design ideas. The point is to sharpen the abilities of students in the process of refining and re-defining ideas, using prototype production as a process for learning rather than as a final step in presentation.

The course will require research into current digital fabrication processes, and require that the research be driven by the results of reductive and generative design processes undertaken throughout the course. The expectation is that some solutions will require approximated, manual,

scale construction using simple materials to demonstrate researched processes which would be most appropriate for the full scale construction of projects generated through the course.

Conclusions

The methods and processes described within this essay mark the beginning philosophical basis for a course which ideally will provide an applicable and timely foundation for students seeking a variety of directions in design education. The generative agenda for projects is a spatial one, intended to address a notorious area of discontinuity in the global arena of digital design as noted by Branko Kolarevic in reference to cross disciplinary collaboration who observes: "...design, analysis, representation, fabrication, and assembly are becoming a relatively seamless process… [with]…one glaring exception – the building industry, which is bound to change…" (p. 7).

This course is intended to help students who are interested in being a part of that process, not only to be leaders in coming change, but also to participate in such as a way as to promote an inherently experience based response to human needs in the 21st century.

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