

not
white

diversity in beginning design education



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PROCEEDINGS of the
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the Beginning Design Student
Hampton University Department of Architecture

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Representing the Whole

In the fall semester of 2003 the School of Architecture at North Carolina State University implemented a mixed media representational course supplemented with online content. The goal was to establish a medium that disseminated instructional content and displayed student work. This pseudo virtual classroom, however, was intended to function actively as a medium through which student's perused each other's work and accessed instructional material pertinent to their education. Due to the relatively large class size, approximately 65 students, and the wide range of representational techniques covered, both hand and digital, it was clear that course instruction must be supplemented with a medium that promotes self paced individual development as well as an awareness of the work of one's peers. In such a large class it would be virtually impossible for student's to see all other's work within the traditional model of "handed in" assignments. No doubt, interaction occurs within the studio amid the flurry to complete assignments. Student's exchange techniques and often participate in a healthy form of competition. This however, is typically contained within the boundaries of the individual studio, and its corresponding room, floor or building, limiting the awareness of a diverse range of student work to a familiar few. It was decided therefore, that students would post work to their own website, effectively re-presenting the content produced for each individual assignment. Each website is in return linked to master index on the course website, establishing a publicly accessible online student gallery. With the completion of each assignment, gallery size increases and a catalog of student work is established.

With any representational course, the produced artifact is reliant upon the content chosen for study and presentation. Its associated scale, complexity and materiality affect the range of techniques employed as well as the general interpretation associated with each exercise. For this course, each student was assigned a noteworthy recently completed building. They proceeded by selecting a segment of their assigned building. Size and complexity of segments varied with the scale of each building. This segment served as the focus of all subsequent exercises throughout the semester. As media and techniques varied, the object of presentation remained constant. With this, students focused exclusively on what and how to represent rather than simultaneously designing content and deciding how to represent it. The media affected message.

This paper seeks to prompt a discussion concerning the introduction of representational techniques to the beginning design student. The growing number of digital techniques and yet the value of traditional techniques has dramatically increased the architect's repertoire. The learning curve, however, associated with many of these new digital tools is significant and the resulting work produced by students is often tethered to the computer and difficult for others to observe and learn from. How does one respond to these increased pressures? Does this require an increased level of specialization within a student's curriculum or is it essential for students to develop a facility with all these tools? The implementation of the representation course at North Carolina State University was intended to explore these new pressures through the use of alternative teaching methods. The content of this paper discusses in depth many of the issues that prompted the creation of such a forum and speculates upon the potential for alternative methods to enhance the effectiveness of an increasingly complex set of techniques and their implications upon the creation and representation of architecture.

abstract

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Jeremy Ficca received his professional BARCH from Virginia Tech and his post-professional Masters of Architecture from Harvard University. Professor Ficca has taught studios at The Boston Architectural Center and Harvard University and practiced in the offices of Machado and Silvetti, Pasanella+Klein Stolzman+Berg and The Office of Peter Rose as a senior designer and project manager. During his tenure at these offices, Jeremy's professional experience included notable projects such as The Getty Antiquities Museum Expansion in Malibu California, the Princeton University Master Plan, the University of Utah Museum of Art, Whitney Museum of Art expansion study as well as private residences across the United States.

Professor Ficca's research involves common and emerging materials and their application related to topics of production, culture and customization. His research was included in Harvard Universities Immaterial / Ultramaterial exhibit and publication and presented at national conferences. Professor Ficca joined the faculty of North Carolina State University in the Fall of 2002 as a tenure-track Assistant Professor of Architecture. He was awarded a 2003 North Carolina State University Faculty Research grant to explore variation within serialized manufacturing related to the surfaces of architecture. Through his research, Jeremy seeks to probe emerging alternative relationships between design and fabrication fostered through the use of digital techniques.

The influence of digital media upon the practice of architecture, albeit still in its relative infancy has affected all facets of design and production. We as architects have been prompted to reevaluate if not adjust the way we operate on a daily basis. The fact remains that for the majority of practice, the computer and its associated digital media has largely been relegated to two roles; an instrument for the efficient production of drawings and an instrument of representation. The relative timid use of digital media can be traced to many factors, unfamiliarity and subsequent skepticism of its benefits; a longstanding method of working and conventions based on hand drawing and cost, time and anxiety to mention but a few. Over the past decade a generational gap became evident between those new to the profession, equipped with emerging skills related to the use of digital media and those well positioned within the profession with limited understanding of the potential of this new media, let alone the skills to operate it. As is the case of many technological advances throughout history, the resulting application has widely conformed to existing conventions and preconceptions. The academy and a select group of practices linked closely to it have in some cases embraced the discipline and unanticipated behavior this new media brings to the design process.¹ In both cases, the academic environment affords the opportunity for a critical engagement of an instrument that is another tool in an architect's repertoire, but also a medium with evolving influence. The pedagogical dialog related to the infusion of digital media within the academic environment is broad and well documented and suggests alternative studio models such as paperless studios.² Where and how digital media is introduced to the student requires consideration.

This paper reflects upon the integration of digital media within the curriculum as implemented through the creation of a course addressing both analog and digital media. It seeks to propose alternative models of instructional forums in which education and evaluation respond to the opportunities and constraints associated with the learning and application of these new tools. Furthermore it prompts a reconsideration of the position of digital media instruction within the curriculum and its impact on the culture of studio and the curriculum in general.

Analog Osmosis, Digital Dismay

The dissemination of analog representational techniques, specifically drawing, has occurred across a wide range of forums, including but not limited to self-instruction, workshops and formal drawing classes. Typically these are tethered to the design studio either in the utilization of its physical space or in association with a particular studio design project. In the design studio the object of representation usually is the object of design. Exceptions, such as precedent studies or found object documentations are typically limited in content or duration. The reciprocal relationship between design and representation promotes a design process integrally related to the media, allowing for the coexistence of multiple forms of representation. This is evident in the drawings of Carlo Scarpa where the drawing sheet seamlessly blends sketches and technical drawings at multiple scales. (See Figure 1.) Historically, the relatively shallow learning curve of many of these techniques promoted dissemination down through the ranks in which students taught each other, resulting in a general culture of resourcefulness. Simply stated, students are inspired and compelled by the work of their peers. Conversely, digital media often involves a steep learning curve and requires pointed instruction. Additionally, the intrinsic tether between hardware and software results in design artifacts that are often exclusively virtual. This results in a selective display of work, often inaccessible to one's peers other than at the time of review or jury. Compounded by each other, these two factors potentially contribute to a studio environment in which the development of technical and design skill is compromised by a lack of dexterity with the tools. Although the design studio is the forum for the infusion and application of digital media, it must not be degraded into a lab for software instruction.³ For these evolving sets of techniques to become truly integrated into the studio sequence the foundation of skills and awareness of potential must be laid elsewhere.

Becoming Digital

The position of digital media instruction within the curriculum determines its utilization by the students and affects its subsequent utilization within the profession. If it is to be utilized as a tool for design inquiry, not merely an instrument for efficiency, students

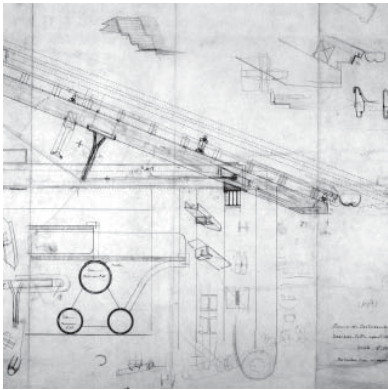


Figure 1 - Carlo Scarpa Design Drawing.

must begin the process of experimentation early in their education. They need not achieve mastery, but rather become familiar enough with the technology so as to be able to strip away its mythological veneer.⁴ This requires time for experimentation with each of the various studio topics within a curriculum. The utilization of digital media in the creation of form is quite different than the study of site and context. By providing foundational skills early in the curriculum confidence and familiarity are fostered. This promotes a skillful and thoughtful engagement of the tools later in their education and eventually in the office.

At North Carolina State University a required digital media course and digital studio sequence aim to promote this engagement. The lecture course occurs in the semester preceding the digital studio, allowing students to develop a repertoire apart from the typical demands of studio. The College of Design at North Carolina State University has a rich tradition of making in which, the value of analog techniques, as a tool for representation and a cornerstone of visual education, remain significant. Indeed, digital media should not supplant this heritage. It's use within the studio however is inevitable and requires consideration in light of current teaching pedagogies. Analog and digital media reveal noticeably different issues and biases.

With hand drawing, the drawing describes a three dimensional object or building that does not yet exist. (See Figure 2.) Notions of abstraction, process, scale and context are tied to the drawing surface and the process of hand drawing.⁵ Scale, paper size and orientation are all considered at the onset. Process is recorded through each sheet of paper or layer of trace and readily available for reference. Replacing hand drawing with digital media in the entry studio undermines the ability for students to recognize these issues. The computer allows one to work directly on the three-dimensional object, effectively eliminating the abstraction of hand drawing and flattening the distance between designer and object. *As a consequence of this, the effect of working on the computer is cumulative. Nothing is lost. The designer moves from detail to ensemble and back again, potentially inverting traditional design hierarchies.*⁶ Although it is feasible to address some of these issues through digital media, such as saving unique files for each iteration, their latent value within the process is best conveyed to the entering student through analog techniques.

Implementation

To encourage the infusion of digital media within the architecture curriculum an analog and digital representation course was implemented. Currently this consists of undergraduate and graduate students and occurs in the third semester for undergraduates and first semester for graduate students. Due to the relatively large class size, approximately 65 students, a workshop or studio model would prove ineffective for instruction. This was compounded by the objective to address both analog and digital techniques over the course of one semester. As a result, work would be completed at desks, on laptops and in computer labs, fragmenting and limiting individual consciousness of peer work. If such a course is to be effective at fostering an infusion of digital media into the foundation of design inquiry, beyond instilling the necessary skills, it must present the discourse associated with the media and promote a culture of shared knowledge. As a result, a hybrid format was adopted, providing lectures regarding topics related to the application of digital media within the discipline of architecture and tutorials for the software utilized. This was supplemented by a course website which provided all course related material and functioned as a portal to online galleries of student work. At the commencement of the semester, students were instructed on the basics of website creation. Following this, they were required to post individual websites that functioned as a medium to display completed assignments. With the completion of each assignment, gallery size increased and a catalog of student work was established. Hand drawn assignments, such as planimetric and projected drawings were scanned and posted, eliminating the necessity to submit originals. The course website permitted a public perusal of all student websites while providing a means for assignment evaluation by instructor and teaching assistant. This promoted familiarity with peer work from other studios or programs (graduate student studios are located in a separate building than undergraduates) and encouraged a dialog outside of class.

As with representation in general, the final product is reliant upon the content chosen for study and presentation. Its associated scale, complexity and materiality affect the type of techniques employed as well as the general interpretation associated with each exercise.

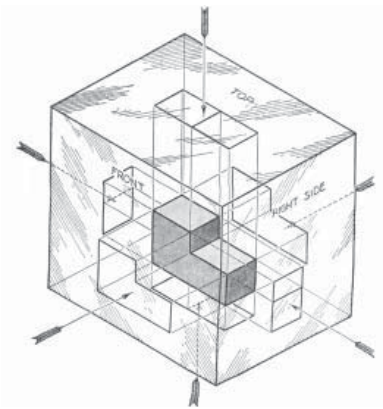


Figure 2 - The Glass Box, from Technical Drawing Giesecke, Mitchell and Spencer, 1958.

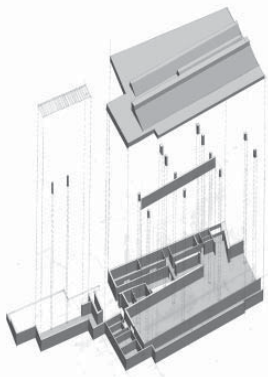


Figure 3

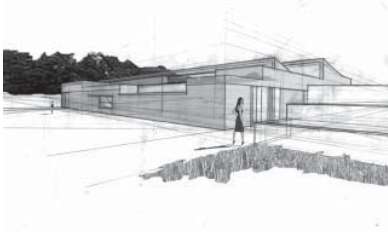


Figure 4



Figure 5

The techniques addressed; analog planimetric and projected drawing; raster and vector manipulation; website creation; two-dimensional digital drawing and three-dimensional digital modeling, rendering and animating were numerous and for some, relatively complex. (See Figures 3, 4, and 5 - images from Architectural Representation Course at North Carolina State University, Fall 2003.) Assignments therefore, focused exclusively on representation. Utilization of this media as a design tool would occur in the following semester's digital studio. Students were each assigned a unique noteworthy building, from which they chose a segment of reasonable size and complexity. This provided the content for each of the ensuing exercises. With the object of inquiry given, students could focus exclusively upon utilizing the tools to assist in representation. Although the end goal is to foster a critical utilization of digital media across all facets of design inquiry, to start, students must develop a reasonable dexterity with the tools. Considering this, design and representation would prove burdensome and divert student focus. For efficiency, assignments often combined more than one technique. Perspective hand drawing assignments for example required students to draw, scan, digitally manipulate and post online. This promoted a hybridization of techniques while allowing students to develop analog and digital skills simultaneously. As a result the course addressed a number of techniques.

As the area of influence of digital media upon the design and construction of buildings expands, the knowledge and skill required to navigate this terrain steadily increases. The emergence of digital manufacturing tools such as CNC milling machines and stereolithography within architecture programs expand potential techniques and provide a means to physically manifest, information previously limited to the virtual realm. This however, adds to a growing list of techniques utilized by students and prompts consideration of how best to equip students with the skills required in the context of existing curricular demands. Although there are many tools, their interrelation points to a common thread, the three-dimensional digital model. From this, emerge most digital representation techniques, suggesting a primacy of the medium. Plans, sections, animations and physical models can all spring from this source. As a result, digital media instruction should center on the process of three-dimensional modeling and survey other techniques to expose the connections. This provides time for focused instruction while promoting a design process that utilizes emerging tools. Conversely, a cursory survey of all methods, including modeling, would leave students ill equip to fully utilize the medium in their subsequent studios.

The dynamic of studio will continue to change as digital media becomes more transparent to the process of design. Through this, the instruments for the exchange of ideas and displaying of work will take on new forms. Web based galleries and student hosted websites suggest compelling extensions to the space of studio and offer tremendous potential for new forms of collaboration. The interface of digital media, however is not neutral and simultaneously draws us closer yet further apart. It is through this paradox that we should consider alternative methods of education in which the media is not only a tool for design but also a medium for the collective exchange of ideas.

NOTES

¹ Gregg Lynn, *Animate Form* (New York: Princeton Architectural Press, 1999)

² Muir, E. and O'Neill, R.: 1994, The paperless design studio, GSAP, News Line Statement, <http://www.arch.columbia.edu/DDL/paperless/NEWSLINE.html>.

³ Frederick Norman, "Towards a Paperless Studio," 2001 ARCC Spring Research Conference Proceedings: pg. 89

⁴ Stan Allen, "Terminal Velocities: The Computer in the Design Studio," essay in *The Virtual Dimension*, John Beckman, editor (New York: Princeton Architectural Press, 1998) pg. 246

⁵ James S. Ackerman, "Introduction, The Conventions and Rhetoric of Architectural Drawing," essay in *Conventions of Architectural Drawing: Representation and Misrepresentation*, James S. Ackerman and Wolfgang Jung, editor (Cambridge, MA: Harvard University Press, 2001) pg. 9

⁶ Stan Allen, "Terminal Velocities: The Computer in the Design Studio," pg. 248