

TEACHING

I am deeply committed to teaching. Critical to this endeavor is the integration of my research at the university and the professional, collaborative and creative requirements of contemporary creative practice in the education of architects at all levels. Fundamentally, my teaching has fallen into two categories, foundation-level and advanced design education at both the undergraduate and graduate levels.

UNDERGRADUATE TEACHING (FOUNDATION LEVEL)

For two years, I have served as the coordinator of the first foundation level design studio (ARCH 100A), which in the last semester was comprised of 98 students with seven instructors (six lecturers and myself) and two graduate student instructors. When asked to redesign this course, I positioned it within a larger (but yet to be articulated) pedagogical sequence comprised of the three design studios (100A, 100B and 101) undergraduate students take during their education and building upon the two Environmental Design courses students take prior to the studio sequence. The modifications I made to the pedagogy responded to two areas I saw missing in the foundation-level sequence. The first was a historical understanding of materials and the ability for students to manipulate materials directly. To do this, the studio was focused around the material concrete. Lectures presented the history of this most pervasive material on the planet by myself and invited guest lectures, including Mark Rogero—one of the few people in North America licensed to work with Ductal, an advanced fiber reinforced concrete. Assignments were also geared to hands on exercises where students cast 3 dimensional concrete objects and spaces—an increasingly rare opportunity in schools of architecture as the computer screen becomes the primary domain for design production. The result was quite positive and some of the comments from students, based on the evaluations were:

"excellent. Loved working with concrete"

"projects were engaging and more interesting than previous studios"

The second change I made to the pedagogy was the introduction of a new software designed for the entertainment industry, but which we used as an architectural design, visualization and representation software. The use of the software is part of my own research in which I am establishing work-flows that move from this robust modeling software to more conventional architectural applications. Access to the software was made through an a partnership between myself and the company, Luxology, through the Office of Industry Sponsored Research at Berkeley. Through this partnership, Luxology has provided students with over \$28,000 of their innovative software, used in such places as PIXAR and Lucas Films Ltd. for research and educational use. In the course, I personally teach the software, at which I am quite adept as I used it in my creative practice to produce each of the competitions I mentioned in my research statement, and it is also reinforced by graduate student instructors, who I have taken advanced seminars with me previously. Comments reflecting this component of the instruction suggested that the strengths were:

"Knowledge of digital programs – developing drawing / rendering skills (illustrator, rhino, modo, photoshop)", "Experimentation to [sic] new software", and "overview of concrete, modo, model making & drawing"

A large component of this course was the guiding and supervising of graduate student instructors. We would meet each week to prepare their classes in advance and to develop course materials that would be useful long after the course was over, in the form of written, step by step tutorials of many of the software and processes we used and developed.

Overall, I was very happy with the outcome of the studio. I believe that the course instilled a culture of making physical objects and engaging our excellent fabrication facilities in the College of Environmental Design. While much of the time was spent developing and coordinating the students, lecturers and graduate student instructors *en masse*, I was pleased by the comments of my role as an instructor, which included:

"Ron is a great instructor. Tough but passionate. He made me feel that he believed in my capabilities & this raised my own expectations for myself. Its not often you feel you can approach your prof. outside of class, but Ron relates to his students on that level. I will definitely be asking for a letter of rec. from him because he can attest to his students' work."

UNDERGRADUATE TEACHING (UPPER LEVEL)

Just as with the foundation years, my upper-level undergraduate teaching focuses on the diversity of architectural skill development, understanding of historical and contemporary architecture culture, bolstered with further integration of the research that defines my own scholarship. In the sole upper-level studio I instructed in the undergraduate level, I introduced tools and techniques, coupled with the use of CAD/CAM (computer aided design / computer aided manufacturing) facilities, which at the time were primarily the domain of graduate students. The course was extremely effective from the students perspective as their evaluations of the overall teaching effectiveness (OTE) was 6.83 and the course worthwhileness (CW) was 6.84. One student commented:

"Because Ron expects nothing but the best from his students, he motivates them to produce their strongest work. The fact that Ron is very well-versed in a variety of fabrication techniques and that he is active in the architecture and competitive world today is beneficial to the student since he shares his knowledge."

Another noted:

"Ron Rael is a great professor. He effectively taught us new skills in 3D-modeling and CAM production techniques. He was focused on giving us as much knowledge and experience as possible. His criticisms were always constructive."

Introducing the skills of laser cutting, CNC routing and 3D printing to the undergraduate curriculum at the time was seen as uncertain territory, as few faculty in the department have these skills, but my exposure of these technologies set the tone for new CAD/CAM policies where undergraduates to have access to this technology and today it is not uncommon that undergraduates in the foundation studios and seminars to use these tools.

The largest criticisms of my teaching have come from undergraduate students and their primary concerns typically surround my introduction of software that is not widely used in architecture programs and the demands to make actual objects using concrete. The first criticism, which involves teaching software that is new to architecture pedagogy is a reasonable assessment by students. However, innovation is often seen as non-conformity and my introduction of software that is used in the allied fields of animation and digital modeling, when embraced by the students, has propelled them into some of the best graduate programs and into important roles within architecture offices across the country. In regards to the second criticism, which involves the physical making of objects through casting—I see this endeavor, the actual making of objects, as fundamental to the understanding of architecture practice, and while difficult, it is not without its own rewards. To help improve my teaching, I also intend to apply for the Presidential Chair Fellows Program, which offers ladder-rank Senate faculty a unique and rewarding opportunity to improve their teaching and enhance their career development.

GRADUATE TEACHING (FOUNDATION LEVEL)

Twice I have assisted in re-imaging the introductory graduate design studios. The first graduate design studio for the three year Masters of Architecture program was taught by Professors Mark Anderson (coordinator), Richard Fernau and me. My specific role in the year level was to assist in writing the assignments for the semester as well as to coordinate the studio with the Graduate Student Instructors, whose role was to teach computer aided modeling and manufacturing to the students. For me, the studio was a positive collaborative teaching experience with three professors at very different stages of their

academic and professional careers, which made for great depth and diversity in teaching approaches. Perhaps my own influence to the studio was in the continued pursuit of teaching students about the culture of architectural craft, process and making that is evident in my own work and to push students to make calculated risks that push their own creativity. One student noted:

"Professor Rael is very enthusiastic about the discipline and in discussing new ideas and techniques. He is supporting of innovative thinking, but also careful to keep projects grounded, when they show tendencies of losing their footing in the process."

Another commented:

"Ron's passion and experience with process made him a very valuable asset to the class. He was good at recommending outside references and methods on an individual level." and went on to add, "His sense of humor, similar to Fernau's, was also really great!"

I was happy to read this comment, as I believe without pleasure, there is very little long-lasting consequence to teaching.

In the second foundation-level studio 200B, co-taught with Assistant Professor Nicholas de Monchaux (coordinator), we employed our extensive knowledge of architectural precedents to helped re-imagine their role of precedent in Berkeley's foundation sequence, and initiated the use of Branner funds to recapitulate the Grand Tour by traveling for ten days in Europe to examine, and propose additions to, canonical historic architectural precedents. Regarding my own contributions to the course, one student noted, "Ron really cares about how his students are doing. He spent a lot of extra time to make sure everyone was seen at least once in a class time if not more. I really enjoyed his enthusiasm. He encourages students to push themselves and take risks."

GRADUATE TEACHING (ADVANCED STUDIOS, SEMINARS AND THESIS)

My experiences teaching in the advanced studio sequence was an enormously positive experience. In my first semester, I led a course related directly to my research aims and asked students to rethink how architects could address the security issues on the U.S. / Mexico border and we traveled to the border to speak first hand with representatives from Homeland security, Customs and the U.S. Border Patrol. The students found it to be an incredibly insightful course as evidenced by the evaluations (OTE=6.5, CW=6.37). One student commented that this was *"one of the most challenging studios I have ever taken, and one of the most rewarding."*

For me, it is important that work from the advanced studios has consequences outside of the classroom, which was the case for several projects. The project by John Voekel, whose proposal was for a shade structure and pedestrian bridge for the busiest land port in the world connecting San Diego and Tijuana, won First Place in the Seeking Shade International Student Design Competition.

Another student, So Rae Yoo, won 2nd Prize in an international competition using her proposal that the U.S. Mexico Wall as a living garden, to re-imagine the wall around the Suffolk County House of Correction Facility in Boston for the ShiftBoston International Ideas Competition.

"Water Border," a paper and design proposal from the studio, by M.Arch/MCP student Adriana Navarro, was accepted for publication in the book *Unspoken Borders: Ecologies of Inequality* (University of Pennsylvania, 2009) as part of the Unspoken Borders 2009 conference, "Ecologies of Inequality and the Future of Design in Race + Space + Politics." Navarro's proposal focused on the hydro-politics of the U.S.-Mexico border, suggesting a re-envisioning of the border fence as an infrastructural water storage and treatment plant for the City of El Paso and Ciudad Juarez. The publication, available May 2009, includes articles and design proposals from professionals in the fields of architecture, landscape architecture, urban design, and city planning on a range of topics related to race, class, and culture.

The project by student Edwin Agudelo, entitled *A Practice in Excavating and Envisioning Ambos Nogales*, was selected for exhibit in the *2x8:SHIFT 2009* competition organized by the American Institute of Architects, Los Angeles Chapter. The 2x8 Program, launched in 2002, recognizes and supports exemplary student work from architecture and design schools throughout California. The project was based on locating, excavating and envisioning three underground border systems: infrastructure (sewage tunnels), natural systems (caves), and illicitly dug tunnels, which through a system of aggregation, might suggest a specific spatial dynamic capable of being programmed for public access. Much of the potential for me exists within what I feel is the futility of the border fence as a definitive and defensible measure. Part of this dynamic is already visible at the border fence in the form of breaches that occur on a daily basis.

My most current role in the graduate studio sequence, instructing a year-long research thesis has been perhaps the most rewarding experiences in my teaching career. In this course my past research in additive manufacturing was a platform upon which students could further explorations in material development. In my own assessment, this is the most important work I have seen arrive from my teaching and it should have lasting consequences. While this studio was only completed in May, 2010, immediate long-term consequences I can see are the invention of two materials coming from the research—salt and paper—which will continue to be employed in the CAD/CAM lab because of their ecological and economic viability for additive manufacturing.

My more consistent teaching role in the Graduate program has come in the form of a new digital fabrication seminar, I first created in the Spring 2009, which resurrected an important and unused resource owned by the department—the computer numerically controlled (CNC) router. In collaboration with the Architecture Shop, administration and dedicated students the CNC router was used to explore the production of ceramic building components. The seminar initially was taught in conjunction with a DeCal course taught by two undergraduate students who were capable and well versed in the use of the CNC router. The seminar was also supported by the ceramics facilities in the Department of Art Practice. The seminar was also bolstered by a gift of software by Luxology, makers of modo. The gift, valued at \$10,740, supplied 12 copies of software used to explore 3D modeling and fabrication, was installed in the Wurster Computer Lab for all students to use. The collaboration with Luxology was facilitated by the Office of Industry Sponsored Research. The cross-departmental collaboration, the making of full-scale architectural components and the introduction to new software and manufacturing processes proved to be an incredible learning experience for the students. I have since taught this course three times and each time it is over-enrolled and the evaluations demonstrate the success of the course. “This is the best class I’ve ever had at Berkeley”, commented one student. Another noted, “Incredible opportunity to take advantage of Ron’s work in integrating his research across departments.”

My thesis students’ work has had similar successes. Students on whose thesis committee I served as chair, Matthew Bitterman, was awarded the 2009 KMD Prize Recipients for Design Excellence in Digital Architecture and the work of Taylor Medlin was published in the publication, *Utopia Forever: Visions of Architecture and Urbanism* (Berlin: Gestalten, 2011) alongside well-known architects IwamotoScott and Andrew Kudless.

For the upcoming 2012-2013 academic year have been appointed the Director of Studio One, a one-year, post-professional design studio intended for those who have a professional (accredited Bachelor of Architecture) degree, and wish to continue to explore current design issues in a stimulating, rigorous, and experimental studio setting and look forward to the challenges and rewards of those two endeavors.