Cal Poly Architecture and Architectural Engineering Studio: A Collaboratory

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At California Polytechnic State University, San Luis Obispo (Cal Poly), Architectural Engineering (Arch-E) professor Kevin Dong spearheaded an interdisciplinary collaboration, which started as an off-campus collaboration\(^{33}\) in its first year, and in subsequent iterations over eight years, involved a partnership with Cal Poly’s Department of Architecture and faculty members Jim Doerfler, Thomas Fowler and for a time, Mark Cabrinha. Since the faculty were teaching the interdisciplinary courses for architecture and architectural engineering students as an overload, it was helpful to have multiple colleagues involved to share the time commitment. Additionally, the faculty forged strategic academic and industry partnerships with ARUP (Dong’s employer before he began teaching) who gave workshops on collaboration and provided feedback during a weekend-long charrette, and education specialists at AutoDesk who supported the digital learning process.

In each iteration, undergraduate students from both disciplines who were completing their fourth year (with the addition of a few graduate students) were joined for a two-quarter studio to design buildings with either a long span or tall building component. For the Arch-E students the studio served as the senior project and for the architecture students, it was an elective studio.\(^{34}\) The studio met on Tuesdays, Thursdays and Saturdays (to accommodate the faculties’ schedules since they teach other studios on Mondays, Wednesdays and Fridays) and as a result, the teaching approach was a little less formal, which helped to support the collaborative process, which was a bit slower.\(^{35}\) The faculty began each quarter with a team-building exercise, and then the students co-developed the conceptual framework that drove project development. The students were asked to do a lot of physical modeling, and to learn digital tools, which helped to establish a common ground. They bonded through field trips (to visit the project site, significant nearby buildings, and architecture and engineering offices in that city) and ultimately developed highly integrated architecture, structural and cladding systems that were presented by the students to faculty and practitioner juries. Students received lectures from faculty and practitioners on structural/cladding systems, siting, massing, adjacency, materiality, programming, natural ventilation, day lighting, computer generation and modeling, and constructability. A high degree of ownership was fostered in all team members from day one of the project: “handing off” (where the architects might make the form and then the engineers resolve the structure) was forbidden. All students worked together at the same table for the duration.\(^{36}\) At least once during the courses, students from each discipline were asked to present the concerns and challenges of the other discipline; in other words, the architecture students presented the structure and the engineering students presented the architectural aspects.

Faculty cite numerous benefits that resulted from pairing students in architecture and architectural engineering. “The most telling comment about the success of the studio is when someone from the jury asks ‘which one of you is an architect and which one of you is an engineer’, after the presentation has finished.”\(^{37}\) Faculty also describe observing valuable “negotiation and collaborative decision-making skills” and that the course enabled faculty to
"contextualize the education that students are getting in the classroom and better prepare students for the range of practice models they will be exposed to after graduation." The courses have been recognized at multiple academic conferences, receiving a national NCARB Prize in 2010 for demonstrating "Creative Integration of Practice and Education in the Academy."