

Collaborative Professional Services: A Case Study in Graduate Outreach

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Outreach is a common form of service learning and scholarship at many institutions, providing valuable perspective for both the academic participants as well as the beneficiary of the work. Historically, outreach undertaken by students in disciplines of the built environment have centered around physical construction or assembly, which inherently requires the projects to be of a smaller scale, due to constraints of time, budget, and expertise. This paper presents a case study representing a repetitive effort of an established interdisciplinary graduate program in which the outreach comes in the form of professional-grade schematic design and pre-construction services to public and non-profit entities that otherwise would not have the resources to procure them. By trading 'physical' construction for 'virtual' construction through BIM as a common language, students are able to dramatically expand the scale of outreach projects on which they work. This structure also more closely parallels project-based initiatives in the professional practice of design and construction. By doing so for actual clients who have parameters of many types, students acquire critical thinking and analysis skills that will not only better prepare them for their professional career, but also arm themselves with an awareness of the benefits of outreach. Simultaneously, it builds a foundation for giving back to the community as they begin their careers.

Key Words: collaboration, outreach, service learning

Introduction

For many universities, outreach and its dissemination is a form of scholarship that is recognized as having both scholarly and social value, and is articulated as such in their respective missions. It is an important part of student learning and institutional community relations. In combination with disciplinary studies, its projects serve the community and often also advance research in both industry and academia. Through a variety of outreach departments, community service and industry partnerships, students are given what is often defined as "hands-on" service learning opportunities. These various service programs and initiatives support institutional missions to serve, empower, and improve their surrounding communities on local, regional, national, and international fronts.

As with outreach efforts in many academic disciplines, outreach opportunities for students of the built environment often involve projects in which they provide notable amounts of labor. Traditionally, this has served outreach missions well, by not only providing service to the project goal, but also in giving experience in construction, assembly, and material handling, all of which are useful to students as part of their education. There is a rich history of students participating in these types of service-learning opportunities through a variety of vehicles, many that are a function of a custom project, and others that are more prototypical or program-based such as Habitat for Humanity.

Within the design and construction academic disciplines, there are also a small number of more 'boutique' efforts that have demonstrated a continuity of success, such as Auburn University's Rural Studio which has been in operation in Hale County, Alabama since the early 1990's. Critically acclaimed, this program immerses students in a longer, more structured effort in outreach and service learning. Still, at the center of these efforts is the actual and

physical construction of capital assets, which, because of the nature of building, mandates that the scale of the outreach project be small. This is largely a function of constraints related to timing and the academic calendar, MEP system acumen, permitting and inspection requirements, and often budgets and fundraising.

In the past decade, there has been somewhat of an emergence of select efforts of this type that are interdisciplinary in nature; generally the most common building-oriented service-learning efforts in academia are traditionally discipline-specific. Whether this is a function of inconvenience, lack of interest, coordination of academic credit, or other issues is debatable. There are, however, several programs that are breaking down this impediment, some more widespread such as Engineers Without Borders, and others more school or project specific such as the Solar Decathlon competition.

This paper offers a case study of a unique type of graduate program outreach within the design and construction disciplines. One that not only is equitably populated by students from construction management and architecture undergraduate backgrounds, but that does so on projects of “commercial” scale. By a willingness to forgo the physical ‘hands-on’ construction component, the projects within the program become liberated from many of the constraints that traditionally limit the output of a project. This structure sets up a paradigm in which interdisciplinary graduate-level teams are poised to provide schematic design and pre-construction “professional” services to clients who would like to develop community service based capital assets, but who do not have the means or resources to bring valuable, formative design and construction services into their project that might otherwise be limited. In doing so, this also creates an opportunity to construct virtually, utilizing BIM platforms as a common language to operate at such a scale.

Literature Review

The involvement of undergraduate and graduate students with projects in the professional realm helps them to gain valuable insight and skills. Interaction with industry professionals and outside clients exposes them to the realities of working in their chosen profession and establishes a greater knowledge of current practices and trends. The students’ engagement can mutually benefit a community or client and the growth of their understanding. Academically, outreach and service learning projects successfully fulfill the requirements for program accreditation and attract new students and funding. In a time when educational institution funding is decreasing, outreach programs in partnership with private entities and real clients may also prove to be financially self-sufficient (Bok, 2003).

Many higher education institutions offer student outreach and service-learning programs. A wide range of degree programs including Law, Business, Social Sciences, Engineering, Medicine, and the Arts have created opportunities for their students to be engaged in the professional world, of which several examples are found in the American Association of Higher Education’s monograph series on service learning in the disciplines (1997-2005). Some outreach models are in the form of a volunteer club such as Habitat for Humanity; an off-campus cultural experience such as study-abroad or Americorps; a community development partnership; youth education; or independent student studies. The form of outreach for degree programs in planning, design and construction fields varies between hands-on building projects and hypothetically applied design proposals. The scale of the service-learning projects tends to be large master planning or small enough to be started and completed within an academic year or semester. Students have exposure to planning phases and construction phases, with sometimes much more time spent on the latter. For design and construction disciplines in recent years, teachers and students alike have sought more service-oriented programs and suggest community outreach be integrated into higher education curricula (Boyer & Lee, 1996; Pearce & McCoy, 2007; AIAS, 2002).

While hands-on design-build programs offer a unique and valuable student experience and community service, they don’t always represent the day-to-day practices of professionals (Molenaar, 2006). Many programs for these disciplines ultimately dedicate much of students’ time in the physical construction of their designs, which is beyond the scope of what they will likely do in practice. For example, most graduates of a Master of Construction Management program will spend more time in professional practice scheduling subcontractors than nailing floor boards. The majority of opportunities for applying practical professional services are still through classroom study of hypothetical projects. Yet, industry professionals question whether these learning models effectively prepare

students for jobs (Molenaar, 2006).

Design and construction schools have a long history of involvement in community outreach programs that are increasing in scope and impact (Hardin et al., 2006). Many planning, design and construction education models of service-oriented outreach integrated into curriculum are manifested in unique studio collaborations with community development groups, offering specific boutique design and construction solutions. These programs focus on providing service-based professional assistance to local needs. Prominent examples in schools of architecture include Auburn University's Rural Studio (Dean and Hursley, 2002); the Tulane City Center collaboration of architecture and planning students on behalf of rebuilding New Orleans (Bernhard, 2010); and the Gulf Coast Community Design Studio in conjunction with Mississippi State (Perkes, 2009). In the construction management and building science discipline, examples of outreach are seen at the University of Florida's Community Outreach Studios (flcdc, 2011); Michigan State's Housing Education & Research Center (spdc, 2011); and Virginia Tech's construction management outreach studios (Pearce and McCoy, 2007).

Although these programs have been very successful and beneficial, only a handful of design and construction outreach curricula work collaboratively across these disciplines. This would seem a natural reflection of the building industry shifts toward integrated project delivery and BIM which continue to challenge and change educational models (Forgues et al., 2011). Degree programs and studios focusing on the design-build methodology of the building industry have met some of the demand for integrated practice, yet these programs are also often limited in the scale of projects and emphasize the hands-on involvement of students. Examples of service-oriented cross-disciplinary outreach programs are the University of Virginia's EcoMOD studies in prefabrication between engineering, industrial design and architecture students (EcoMOD, 2011); and Washington State University's Interdisciplinary Design Institute formed and led by a diverse panel of volunteer students (Interdisciplinary Design Institute, 2011.) These programs integrate design and construction students with other disciplines and community or private clients focusing on specific built-environment needs or projects. However, these projects are predominately limited in scale to scopes that are fully serviceable or constructable by students.

Methodology and Pilot

The methodology for this effort is a qualitative continuum within an established interdisciplinary graduate academic program, and this paper presents a case study of one recent project that the authors believe to be demonstrative of the potential for this type of non-traditional outreach. Given that there are few, if any, established interdisciplinary outreach efforts of this type in academic design and construction disciplines, such a qualitative case study is an appropriate vehicle to disseminate the results.

In the 2009-2010 academic year, the "client-base" of the academic program consisted of private/for-profit entities, including an auto manufacturer and a group of surgeons, as well as one non-profit economic development company closely aligned with mid-sized municipality. External or "real" clients provided a context for problem solving, including a real desire for an investigation into the production of some capital asset, as well as the financial, time-related, and other constraints that come with that desire. Given potential academic and community benefits of outreach work, the directors felt that the program, which had focused on larger, more complex projects through a management-centric curriculum for private clients, could also include more community outreach efforts. The result would be a new model that allowed the benefits of service learning without the constraints of the actual construction process. Students would work with real-clients in real communities on larger projects providing professional-level services that more closely resembled their eventual careers in practice.

In the fall of the 2010-2011 year, this new initiative was launched on a pilot basis through the vehicle of a national competition that partnered student teams with community-based not-for-profit organizations in New Orleans, LA. Students in small teams worked directly with their non-profit partners to develop proposals for two multi-use community centers in the Algiers-Riverview and Hoffman Triangle neighborhoods of New Orleans. Financial viability was a major component of the proposals, and, as such, students spent significant time speaking with residents, community groups, developers, entrepreneurs, and financial institutions to put together ownership and management structures, capital budgets, operating budgets, and owners' pro forma. In addition, the projects were

designed to a schematic level, and included sustainable strategies and energy analysis, first-cost estimates, site-utilization plans, schedules, and constructability analyses. Because the work was driven and informed largely by the needs of the non-profit partners and the communities in which they worked, the competition aspect became a somewhat of “side-project” or corollary benefit. The competition did prove to be a success metric, however, as one of the project teams advanced to the finals of the competition and had the opportunity to present the work to a large public audience in New Orleans. The success of this project, both in terms of general quality, working relationships, and recognition via the competition, afforded the connections that would lead to the case study project, which best exemplifies a successful model for collaborative professional-services outreach.

Case Study Results and Discussion

Through contacts gained during the community development competition, the directors of the program were introduced to Artspace, a not-for-profit real estate developer out of Minneapolis, MN. Artspace’s mission is: “[...] to create, foster, and preserve affordable space for artists and arts organizations. It pursues this mission through development projects, asset management activities, consulting services, and community-building activities that serve artists and arts organizations of all disciplines, cultures, and economic circumstances. By creating this space, Artspace supports the continued professional growth of artists, and enhances the cultural and economic vitality of the surrounding communities (Artspace, 2011).

Artspace has development projects complete or underway in 36 locations across the U.S. Following the radical restructuring of the Orleans Parish school system following hurricane Katrina in 2005, a number of former public school buildings throughout the City of New Orleans remained empty or underutilized. In 2011, Artspace was in the planning and site acquisition process to redevelop the Andrew J. Bell Junior High School campus in the historic Tremé neighborhood of New Orleans. The Bell School campus, consisting of six building on two city blocks (Figure 1.), was in an advanced state of disrepair, having been largely unmaintained and exposed to the elements for five and a half years.

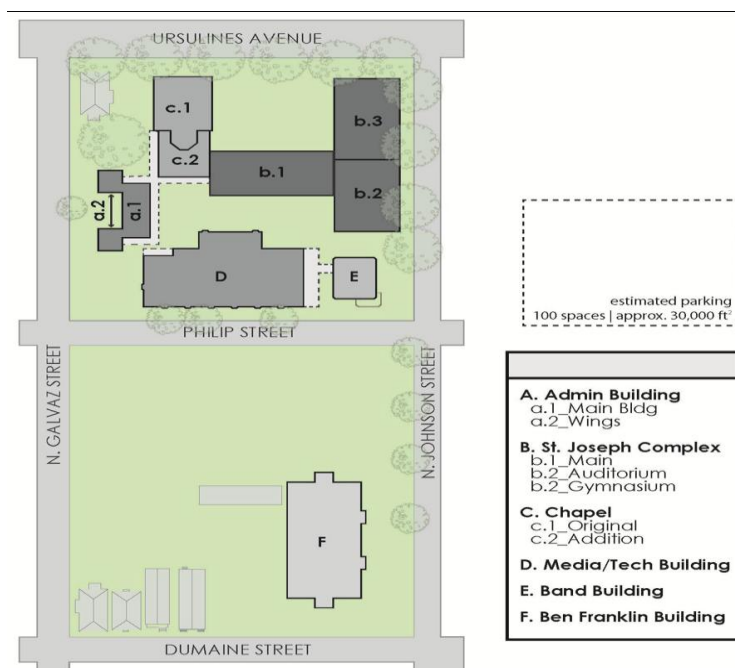


Figure 1: Site plan

During introductory conversations with Artspace, the directors of the program recognized the potential for the project and the partnership to fit in well with the goals of the academic program. This meant that not only did the project present a rich potential learning opportunity for the students, but that Artspace and the surrounding Treme' community had a need for the services that the program could provide. Artspace, at the outset of 2011, had not yet acquired the site from the Orleans Parish School Board, but had begun planning on the facility and had begun to put potential tenants in place for non-residential components of the development program. In addition, site documentation was sparse and strategies for building reuse, demolition, or new construction had not been fully developed. At the same time, because much of Artspace's work was focused on site acquisition and project planning, especially financial aspects, the organization was not yet in a position to hire a local, professional design or construction team -- an aspect of Artspace's work that is critical to their mission of community betterment. From the standpoint of the graduate program, this meant that the students could engage in programming, site analysis, concept/schematic design, as well as pre-construction services consisting of a site survey, constructability analysis, conceptual cost estimates, and a project schedule. This work would inform and supplement the work performed by Artspace staff members, and eventually could be handed off to the local design and construction teams when they were brought on board.



Figure 2 : Students conducting survey using total station

In structuring the work that students would undertake, it was decided that a portion of the study would focus on analysis of the campus as a whole. This would include a zoning study, a parking study, a site survey (Figure 2) to locate all buildings and produce accurate area and elevation information, a strategy for systems integration, and the production of a base building information model. In addition, students would undertake the focused design and pre-construction analysis of a key newly-constructed building on the campus -- a new facility for New Orleans Access Television (NOA-TV), a public access television station. The NOA-TV building also included a public cafe and flexible space that would complement both the residential artist's community and an adjacent multi-tenant non-profit center. Student work at the campus level directly contributed to ongoing Artspace efforts such as grant applications, meetings with school board and city officials, and eventually, a zoning change application. Accurate building information models helped in the development of Artspace's capital budget and pro forma. The focused television station design included a detailed existing program study and user group meetings with NOA-TV, that resulted in a workable program for the new facility, as well as a schematic design for the building, including structure and MEP, constructability, site utilization, sustainable strategies, cost estimate, and schedule (Figure 3.)



Figure 3: Section perspective of NOA-TV design proposal

The project was carried out over approximately 14 weeks, spanning the spring and summer semesters in 2011. Student teams conducted analysis on site and met with clients and stakeholders over the course of approximately five days of work on the ground in New Orleans. In addition, one co-located charrette was held at the graduate program's university facilities. Biweekly project briefings were held between Artspace and the students via both phone and video conference. Artspace and its representatives were very committed to the relationship and saw the value that the student work could bring to their process, as such there was more informal email and telephone interaction on a weekly and, at certain times, daily basis. It should be noted that one of the challenges in conducting this type of work from an academic perspective is that clients' project schedules and the university schedule rarely align. In this case, however, the conclusion of the student work and the submission of their final deliverables corresponded neatly with the hiring of the first member of the local design and construction team, the architect. Thus the final presentation of the student work was made to both representatives from Artspace and the architect's office, representing the hand-off of the student work to the professional team.

Summary and Conclusions

Outreach opportunities in academia present a variety of vehicles in which to deliver their benefits to the community

and beyond. While opportunities to provide physical labor will not (and should not) go away, this case study demonstrates that there are successful alternative outreach conduits that are appropriate and rewarding for academic disciplines in the built environment. Doing so on an interdisciplinary “professional services” basis further strengthens this richness, and serves as a model that can continue repetitively and is transportable to other disciplines.

Metrics for the success of this process are largely anecdotal, as (at the time of this writing) only three months have elapsed since this hand off. However, the anecdotal response has been highly positive. Representatives from Artspace have repeatedly indicated that the input from the students teams came at critical points in their process and helped them to convey their goals to stakeholders and officials in clear and compelling manner. In addition, analysis work and design work helped the client to conceptualize, articulate, and discuss many of the projects critical constraints and goals as a whole for the first time. The architect’s team present at the final review were impressed at the level of complexity dealt with and the level of development achieved in a relatively short time by small collaborative student teams. Since the hand off, Artspace has completed the site acquisition process and is proceeding through design. They have indicated an ongoing influence of the work performed by the students, and have expressed interest in undertaking another project with this academic program if the opportunity should arise. As a project with a mission for social betterment, it can also be extrapolated that the long-term success of the Artspace development and its influence on the community of Treme’ will be the ultimate endorsement of the collaborative outreach model.

From an academic standpoint, the process afforded an opportunity for design and construction students to collaboratively engage on a large, complex, multi-use project with a real client and very real constraints. These constraints included the typical considerations of program, budget, schedule, means and methods, but were also intensified by the vicissitudes of an actual project in the rich and complex urban and political environment of New Orleans. On several occasions, students had to quickly change direction to meet short-notice, unanticipated deadlines, adjust to evolving project conditions, and accommodate client requests. The work was undertaken in an environment that does not only simulate the professional work environment, it is a professional work environment. Thus the collaborative professional services outreach model moves from a paradigm of the “academic project emulating practice” to the “academic project *as* practice.”

A key attribute of this model is the ability to increase the scale of the subject outreach project. This is largely accomplished through project planning and the use of Virtual Design and Construction. The project planning consists largely of identifying and “landing” projects and clients whose needs and goals align with the philosophical mission of an outreach program, as well as the academic calendar and the unique subset of services that student design and construction teams are capable of delivering. The Artspace project described above also had perhaps the single-most important criteria for success in this type of endeavour: a committed, active, and engaged client partner. The importance of this aspect cannot be underestimated, and thus identifying viable projects for students to undertake becomes an intense vetting process.

In stepping away from the physical construction process, and realigning goals on complex commercial scale projects, it becomes necessary to approach building in a different way. This is accomplished through the application of a Virtual Design and Construction (VDC) process, utilizing Building Information Modeling and other digital tools. Again, this process not only simulates but is identical with the current state of the industry with regard to design and pre-construction services on large projects. Like other aspects of this type of project, it provides a unique benefit for project “owners,” especially those being introduced to the value of VDC/BIM for the first time, and it is a relevant skill building opportunity for students.

While the project described in the case study represents the initial attempt at the execution of a collaborative professional services outreach project in the built environment, its anecdotal success and the further development of clear criteria for identifying and engaging future projects make it a viable and replicable alternative and complement to smaller scale design and physical construction efforts in universities with the resources, culture, and motivation to undertake such projects.

References

- AIAS (2002). *The Redesign of Studio Culture: A Report of the AIAS Studio Culture Task Force*. Washington, DC: The American Institute of Architecture Students.
- Artspace (retrieved 26 October 2011). [WWW site] URL www.artspace.org
- Bernhard, Scott (2010). "Engagement, Ecology, and Design Education: Outreach Work of the Tulane City Center." *Innovations: Technology, Governance, Globalization* 5.3: 91-105.
- Bok, D. C. (2003). *Universities in the marketplace: The commercialization of higher education*. Princeton, NJ: Princeton University Press.
- Boyer, Ernest and Lee Mitgang (1996). *Building Community: A New Future for Architectural Education and Practice*. Princeton, N.J.: Carnegie Foundation for the Advancement of Teaching.
- Ecomod (retrieved 17 October 2011). [WWW site]. URL <http://ecomod.virginia.edu/about/>
- Florida Community Design Center (retrieved 18 October, 2011). [WWW site]. URL <http://www.flcdc.org/>
- Forgues, Daniel, Sheryl Staub-French, and Leila M. Farah (2011). "Teaching Building Design and Construction Engineering. Are We Ready for the Paradigm Shift?" *Proceedings of the 2nd Annual CEEA Conference*. Memorial University St. John's, Newfoundland.
- Hardin, Mary C., Richard Anthony. Eribes, and Corky Poster. *From the Studio to the Streets: Service-learning in Planning and Architecture*. Sterling, VA: Stylus, 2006. Print.
- Interdisciplinary Design Institute (retrieved 17 October 2011). [WWW site] URL <http://spokane.wsu.edu/academics/Design/what/>
- Molenaar, Peter (2006). "The State of Design-Build Education in Engineering Programs," *Design-Build Educators Conference, California Center for Construction Education*, San Luis Obispo, California, May 31.
- Pearce, A.R. and McCoy, A.P. (May, 2007). "Creating an Educational Ecosystem for Construction: A Model for Research, Teaching and Outreach Integration." *Proceedings of the Construction Research Congress 2007: Bahamas, USVI: May 2007*.
- Perkes, David (2009). "A Useful Practice [Gulf Coast Community Design Studio]." *Journal of Architectural Education*. 62.4: 64-71.
- School of Planning, Design & Construction at Michigan State University (retrieved 18 October 2011). [WWW site]. URL <http://spdc.msu.edu/RealWorldApplicationsofKnowledge/OutreachEngagementExtensionPrograms/HousingEducationResearchCenter/About.aspx>
- Toor, Shamas-ur-Rehman, and George Ofori (2008). "Developing Construction Professionals of the 21st Century: Renewed Vision for Leadership." *Journal of Professional Issues in Engineering Education and Practice* 134.3: 27

