

Whole School Design-Build in the Liberal Arts Tradition

Design-build education commonly offers a breadth of learning experiences such as design, construction materials and methods, client communications, programming and budgeting, soliciting donations, an understanding of giving to a community, and personal growth and maturity. An abundance of scholarship exists on the aforementioned contributions, but very little is known about how to energize a whole school to where non-affiliated architecture disciplines dramatically influence the design outcomes. This paper provides a design-build roadmap from one Midwestern university rooted in the liberal arts tradition. A case study of seven design-build projects illustrates that volunteers will transition from observers to collaborators when upper level administration directly engages a project. The authors found that the design quality and public exposure increase commensurately with the number and diversity of the volunteers.

INTRODUCTION

“Alone we can do so little; together we can do so much” — Helen Keller

The architect of today is expected to understand the perspectives and needs of a broad, never-ending range of clients. The problem is that the architecture students have minimal opportunities to be challenged by external points of view. While most academic design-build programs provide wonderful interaction between client and student, whole school design-build challenges students to think through the eyes and ears of others. Whole school design-build is a university-wide partnering of all campus disciplines. A business student or a nursing student will be trained to think critically and creatively in a much different way than an architecture student. In a professional setting, a client could be a business person or nurse and at some level the architect is collaborating on design with the client. In an academic situation, the business, nursing, and architecture students are equally responsible for design and build outcomes. The influence and effect on the design can be rich and rigorous. The purpose of the study is to illustrate a whole school design-build model from seven case studies that rallies the scholarly community to accomplish feats that extend beyond the traditional silos of disciplinary design-build projects. Drury University is an independent institution grounded in the liberal arts tradition with approximately 1,600 students and 150 faculty. Art, architecture, behavioral sciences, business, chemistry,

TRACI SOOTER, NANCY CHIKARAISHI, & KEITH HEDGES
Drury University

communications, education, English, humanities, languages, mathematics, music, and philosophy, etc. are some of the degree programs accessible through the whole school design-build.

METHODOLOGY

A case study method (Yin, 1994) was deployed to describe the institutional participation of the students, faculty, staff, and administration surrounding seven architectural design-build projects (Merriam, 1988). The qualitative study is presented in the narrative tradition. The data were the observations from the architecture faculty. The analysis was inductive in nature and searched for themes and patterns across the participants and the projects.

THE CASE STUDIES

The seven selected case studies are a representative sample of the breadth and depth of scale for the design-build activities. The projects are presented chronologically beginning in 2005 and conclude with current undertakings.

Camp Barnabas Bunks

The Camp Barnabas project rewarded the students with an understanding that we are designing and building for others rather than ourselves. Camp Barnabas is a nondenominational church related camp for youths with life threatening illnesses and disabilities (McBee, 2008). The camp is rurally located in Purdy, Missouri, of the Ozarks and is situated approximately 60 miles from the institution. The design-build project was borne through the Extreme Makeover: Home Edition (EM:HE) network television show with the purpose of improving the camp. In 2005, the EM:HE led over 5,000 volunteers, where 20 were composed of Drury architecture students. The students designed and built the interior of the Barnabunk, 40-bunk house. The students participated in an accelerated timeline due to the constraints of the show. The process from demolition to reveal lasted only four days and two hours. The team was on site from the introductory surprise door knock to the reveal, 'move that bus' scene. The experiences with the client and the volunteers brought about a deeper understanding of design. The students worked elbow to elbow with accountants and plumbers, who worked their normal day, drove to Barnabas, worked all night with us, and drove straight back to their jobs. With an extraordinary 5,000 volunteers, the students intimately realized a heightened sense of community and giving in a selfless way. The camp children were truly inspiring as their everyday lives are much harder than the summation of our lifetime problems.

Collins 4-H Barn

The Collins 4-H barn project brought about an awareness that some of the campus community is interested in engaging the architecture process. The 4-H is a nonprofit youth organization focusing on the head, heart, hands, and health through hands-on learning. The project was a barn, housing one horse, one pig, and one sheep for the Collins family in Murfreesboro, Arkansas. In 2007, the 22 students and faculty participants expanded from architecture into other majors with a staff member and a professor of psychology after an all school e-mail inviting all students, faculty, and staff to participate. The 380-mile distance between the school and the barn forged close working relationships amongst the group members where the disciplinary silos vanished in favor of advanced teamwork to solve problems and accomplish the goal.

Habitat for Humanity Home

The Habitat for Humanity home project established that non-architect volunteers could drive an architecture project. The project has a unique origin. Our institution traditionally sponsors public convocations. During the theme year of Sustainability, one student who ironically received a citation for speeding propelled an idea that became the largest whole school service project to date. The non-architecture student convinced the broader faculty and staff to fundraise for the Habitat for Humanity (H4H) organization in support of the convocation theme. The H4H is the largest nonprofit builder in the world with a focus on housing persons with limited financial resources. The project was easily interdisciplinary, facilitated by its initiation outside of the school of architecture. Although the students completed the project in 2008, the process lasted almost three years. The process included fundraising, a semester of design, obtaining build approvals, and the actual build. School wide participation kicked off with the freshman class pre-fabricating the walls for the house and grew as construction commenced. The primary on-site team was composed of 11 architecture students, however, a wide range of disciplines held classes on-site and participated in hands-on service learning 2-3 days a week. The class would listen to a short talk on the sustainable living features of the house prior to the construction activities such as painting, caulking, rain garden planting, framing walls, and final cleaning. The project was open to the entire university through the experiences and relationships gained from Camp Barnabas. The Director of Community Outreach and Leadership Development scheduled and coordinated the volunteers with the architecture design-build professor. The 900 square-foot home in Springfield, Missouri, became the first certified Leadership in Energy and Environmental Design (LEED) platinum home for H4H (Lee, 2008) (see Figure 1).



Hampton Chicken Coop

The Hampton Chicken Coop showed that the ideas of non-architect volunteers could be realized in the built environment. The EM:HE team chose the Hampton family due to the doubling of their family size by instantly adding four nieces and nephews neglected by their parents (Young, 2009). The larger project was the house by the EM:HE team, and our participation was the design-build of the Eggstreme Chicken Coop. The project was only 22 miles away in Ash Grove,

Figure 1. Habitat for Humanity freshman class pre-fabricating walls

Missouri. The coop was the first project that was whole school participation from the beginning, which incorporated the design phase. The extracurricular activity consisted of a three-week design phase plus a one-week build. In 2009, we had over 40 volunteers from diverse campus disciplines including staff and faculty outside of architecture. The non-architects directly influenced and enriched the design. A professor of communications was raised on a farm and expressed the insight for including a chicken waste management system. The result was an ingenious cart on wheels below the chickens that spreads the chicken fecal matter over a field. The collaboration was invigorating and the group stayed engaged in the project through to completion (see Figure 2).



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Volunteer Tribute Garden

At the request of the community, the students designed and built a garden space honoring the 170,000 volunteers who came to the aid of Joplin after the tornado event in 2011. The Tribute was implemented under the constraints of the EM:HE (Verschoor, 2012). The show negotiated to rebuild a neighborhood of seven houses in seven days and to restore Cunningham Park under the same theater. Cunningham is the city's oldest park and where the tornado reached its highest known EF-5 intensity. An entire third year design studio designed and led construction. The students met survivors of the tornados which influenced their design. The design has an empathy sensibility and features four rings of stone walls, four bronzed tools, and four stainless steel pedestals representing the processes of the search and rescue, debris removal, demolition, and the rebirth of Joplin. At the center of the ring, a mosaic butterfly symbolizes the reported stories of butterflies protecting children during the storm (Real-McKeighan, 2011).

The Volunteer Tribute Garden revealed that the support of the upper level administration widens the pool of volunteers by their visible validation of the project. A campus committee consisting of communications faculty, development staff, community outreach staff and upper administration was created to assist the 12,000 square-foot project. The volunteer activities included laying

Figure 2. Eggstreme Chicken Coop

concrete block walls, digging holes for plants, setting plants in ground, watering plants, running saws to build benches, walking the tornado path collecting shards for mosaics, washing student's clothes, running errands to the hardware stores and lumber yards, and delivering food to the site for volunteers. A newly created student group was formed, the Drury SmartMob! The SmartMob! is a flash mob with a broader purpose of providing an opportunity for any person, student, faculty or staff to participate in a community design-build or service needs project. Social media is used to tease, entice, and create enthusiasm around a service project. Large numbers of volunteers are at the core of the SmartMob! success, enabling a big impact through low time commitment. More than 120 students, faculty, staff, and administration joined the SmartMob! to lay nearly 12,000 sq. ft. of sod in 45 minutes (see figure 3). The Tribute was built in 168 hours on a continuous 24/7 job site. Even a Spanish professor led a group of Girl Scout volunteers to help with the butterfly mosaic. Librarians, vice presidents, staff and professors came with their families and volunteered on the weekends and evenings. The administration exhibited strong support by participating in the planning meetings, construction activities, and the offering of scholarships to all graduating high school students impacted by the tornado through the loss of their facilities. The university president lent his truck, and the vice president participated in the planning meetings and build process.



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Butterfly Garden and Overlook

The Butterfly Garden and Overlook project rewarded the students with an understanding that we are designing and building for connections between the living and the deceased. A national grant award by the TKF foundation, the Walmart foundation and in collaboration with Cornell University and the USDA Forest Service permitted the students to design and build a healing garden between 2012 and 2014. The project occurred through a close collaboration with the City of Joplin Parks and Recreation Department from design through construction. Two architecture students worked with community and professors to develop the healing garden concept in Cunningham Park. The garden recreates the outline of three homes erased by the Joplin tornado, provides a pavilion, water features, seven educational storyboards, a butterfly garden and four sacred spaces with benches and journals. The design weaves together four main conceptual

Figure 3. SmartMob! Volunteer Tribute Garden, Joplin, Missouri

design ideas derived from Worden's four tasks of mourning of accepting loss, processing the pain of grief, adjusting to the new environment, and making an enduring connection with the deceased (Worden, 1991). The grant providers deliver a bench and journal. The bench, built by inmates, is a place of respite that invites one to pause and reflect. The journal is a specially created waterproof, blank book and pen combination – located beneath the bench – that invites visitors to articulate their experiences (Stoner & Rapp, 2008). Over 25,000 journal entries have been submitted at various sacred spaces and have been coded by researchers. Social science researchers are currently conducting qualitative research through on site interviews at the Butterfly Garden.

Design development and construction documents developed through two consecutive courses. The student construction contributions were diverse. Twenty music therapy students were introduced to the tragedy of the storm and the volunteers building the healing garden. They responded with a music rejuvenation station playing uplifting music during the blitz build of the garden (see Figure 4). The blitz build was an accelerated construction activity encompassing about a week to optimize the construction activities. The City of Joplin Parks and Recreation Department were an invaluable resource guiding and helping the students during this week. The SmartMob! sent 60 students, faculty, and staff to participate in the blitz build. English students, enrolled in an engaged learning course, collected, transcribed, and archived survivor stories. Another student in a web design class created a website to house the stories <http://storiesofjoplin.drury.edu/>. The students shared the stories with the architecture students who used them as design inspiration. Some quotes were subsequently embedded within the water elements and storyboards. The upper administration supported the project by facilitating the contract writing, grant administration of the project and course releases for faculty.



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Solar Decathlon

The Solar Decathlon project illustrates that industry-university-government (IUG) relationship leads to the widest and deepest collaborations. The most recent and current project is the Solar Decathlon 2015 in collaboration with Crowder College and sponsored through a grant from the U.S. Department of Energy. The project is Drury's first IUG relationship. The competition challenges 20 collegiate

Figure 4. Blitz build Rejuvenation Station for Butterfly Garden and Overlook, Joplin, Missouri

teams to design, build, and operate solar-powered houses that are cost-effective, energy-efficient, and attractive (SD, 2014). As a team from the Midwest familiar with the devastating effects of tornados, we positioned our house to not only be solar powered but also an emergency response unit for disasters. In its fully expanded form, the family home can resist, respond and recover from natural disasters through the use of disaster-resistant sustainable materials. The whole school philosophy is absorbing two schools, 100+ students, and 21+ majors. The disciplinary boundaries are dissolving. By the second month of the 2-year project, the non-architecture students are hanging out on the sofas in the architecture building, which is on the extreme end of campus. The Solar Decathlon has strong curricular impact and the project is becoming the pinnacle whole school design-build project. The University has 16 courses related to the Solar Decathlon in the disciplines of architecture, communications and economics. The College has 34 courses featuring the decathlon related to solar energy, energy efficiency and construction for the solar decathlon (see Figure 5).



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FINDINGS

The findings represent the interpretations of the relationships inside collaborations across the institution. The findings are the major themes elicited from the seven case study narratives. We extracted three primary findings. In the earlier projects, the volunteers transitioned from observers to participants. In the recent projects, the volunteers progressed from participants to collaborators. A paradigm shift occurred in between the two participatory themes, which fostered the collaborative ascent.

From Observers to Participants

We found that the volunteers possess an inherent need to help underrepresented groups and that their numbers would increase when the activities were achievable. Our groups were composed of youths, individuals with different abilities, folks with financial limitations, and the survivors of disaster events. Although not a human group, the Solar Decathlon facilitates and underrepresented energy source with a sustainability theme and hopes to reduce future numbers of persons affected by a disaster event. The volunteers increased and transition from observers to participants when the activities were physically possible for any layperson. For example, watering plants, washing clothes, and running errands

Figure 5. Solar Decathlon meeting

are tasks that most volunteers have already accomplished in their own home. Volunteers went from observers to participants upon the realization that having a high skillset is not a requirement for action. A job exists for everyone with a wide range of comfort levels.

Administration Leverages Opportunities

The administration interprets whole-school design build as a smart way to leverage university wide recruitment and for development opportunities, thereby stimulating new collaborative opportunities. Due to our smaller size and liberal arts focus, the President of the University and upper administration envisioned how the design build projects aligned with four of our six institutional values: elevate regional and national recognition, provide student-centered personalized education, nurture an environment of inclusion for all persons, and commit to a university culture of wellness. All school design build is a good fit with the university engaged learning core curriculum. Students are currently receiving engaged learning credit for decathlon courses. Initially design-build was a good for the architecture students to get involved helping charities in need and underserved communities. By the time of the 7th case study, the U.S. Department of Energy's Solar Decathlon, they rallied their Vice President's of Admissions, Communications, Undergraduate Studies, Development Director and Department Chairs to support the project because they believed they could leverage this project as a recruitment tool, positive marketing and as a way to attract potential donors. The visible and meaningful support from the upper level administration meant that the whole school could coalesce to achieve a goal.

From Participants to Collaborators

The volunteers have an equal voice for design input and a real impact when they are included from the beginning. . Non-architecture collaborators observed their ideas being realized in the architecture product. The initial design charrette for the Solar Decathlon was composed of interdisciplinary student teams majoring in architecture, communications, biology, chemistry, physics, business, economics, graphic design, nursing and education. Everyone gained mutual respect for one another in this process as valid ideas were proposed and incorporated. Camaraderie and friendships develop with these cross-disciplinary teams. We observe communications and business students thinking like architects and collaborators in their work inside and outside the Solar Decathlon project. Recently three non-arch students made a pitch to a potential donor. They presented and fielded questions about the concept and design as well as any architecture student. Having an open call for participants allows people to volunteer for what most interests them. We have had many instances where students of a specific major worked on an aspect of the project completely different from their major, including architecture majors. All student, staff and faculty volunteers have different skill sets. Allowing people to use their strengths and passions empowers people to take ownership of their work and to become powerful collaborators and leaders.

DISCUSSION

When upper administration supports cross-disciplinary whole school design-build, the design quality and public exposure increase with the number and diversity of participants'. The support may not be overtly exhibited on all design-build projects, but as it elevates, the momentum must be grasped and continued through on subsequent projects.

Difficulties

- Inadequate funded material donations and monies for faculty course releases may founder some projects.
- The faculty possesses the big picture and their mentorship of students is required.
- Whole-school communication becomes unwieldy and must follow a systems theory approach bolstered with file transfer protocols.

Successes

- Design is richer with a multidisciplinary team. Everyone can have input and impact on design. This is not the typical “ivory tower” design.
- Working with cross-disciplinary teams has steadily increased the rigor of the work and improved the design outcomes
- New friendships have formed and long-term professional connections have begun for students.
- Impact on human beings is immeasurable. Tributes, healing gardens, bunks for kids with special needs all serve groups who will be touched for years to come. Students will carry these experiences with them a lifetime.
- Intimate work sessions with staff, faculty and local volunteers creates a heightened sense of community and giving in a self-less way. Students gain an understanding that we are designing and building for others rather than ourselves.
- Some prospective students choose this university in order to have an all school design-build experience.
- Fundraising has no fundraising boundaries, initiates the dissolution of the disciplinary boundaries.
- Scholarship projects embraced high-end (behavioral) research
- Aligning design build projects with institutional values opened doors within the university and fostered support from upper administration, key to successful projects at the scale of the case studies.

Whole school design-build is a model involving an entire university community including students, faculty, staff, and administration who participate and collaborate on a project. It creates meaningful learning experiences between students from different disciplines while helping an underserved community. This type of real life engaged learning experiences could help attract more students to a place where these goals are valued.

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