ACADEMIC DESIGN/BUILD PROGRAMS AS MECHANISMS FOR COMMUNITY DEVELOPMENT

by

PAMELA A. RICE-WOYTOWICK

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Approved by:

Major Professor
Stephanie A. Rolley, FASLA, AICP

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PAMELA A. RICE-WOYTOWICK

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Abstract

Academic design/build programs can serve as vehicles for community development. As design professionals working within the community context, architects hold the potential to create community betterment and build community assets through their work, although this focus does not appear to be central to the culture of American architecture. In particular, a review of architecture curricula in the United States reveals the lack of design/build opportunities for students. Design/build programs integrated in academic architectural programs have been in existence for just about two decades. As such, development of their pedagogy and organizational structure is emerging. It is timely to identify the common and distinguishing factors of established design/build efforts in architecture schools and to examine the role community development plays in each. Established academic design/build programs were identified for further study, enabling identification of commonalities within the structural frameworks of programs as well as contextual nuances; the identification of programs which purposely instigate community development; and the identification of the factors within those programs which act as mechanisms for community development. The result is a framework for organizing a community development initiative which is central to the architectural process and to design/build pedagogy.

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Chapter 1 – Project Introduction

Both practicing architects and students entering the profession lament the lack of understanding that architecture students today have for construction and the built reality of their designs. Their lack of building know-how comes not from any deficiency on their part, but from two characteristics inherent in the institution of architectural education. The first is the growing fracture between design and construction, which finds the architect drifting further and further from the contact with the craft of building. The second is the growing imbalance between conceptual thinking and "the idea" (Elvin, G. 1993).

A review of architecture curricula in the United States reveals a lack of design/build opportunities for students. Design/build programs integrated in academic architectural programs have been in existence for just about two decades. As such, development of their pedagogy and organizational structure is emerging. It is timely to identify the common and distinguishing factors of established design/build efforts in architecture schools and to examine the role community development plays in each. Five established academic design/build programs were identified for further study, enabling identification of commonalities within the structural frameworks of programs as well as contextual nuances; the identification of programs which purposely instigate community development; and the identification of the factors within those programs which act as mechanisms for community development. The result is a framework for

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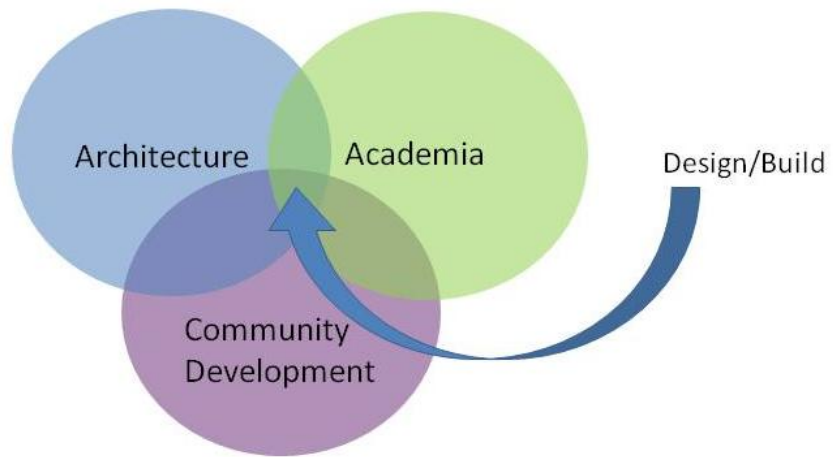
Figure 1.1 Intersection of community development, academia and architecture

Normative Architectural Education Versus Academic Design/Build Programs

Academic design/build projects are generally defined as projects in which students develop and construct a building or other full-scale environment. The main intention of this type of learning initiative is to give students a real-world, hands-on application of lessons learned within the classroom setting. Design/build projects are an important, yet not universally subscribed, element in professional architectural programs.

Contemporary architectural education involves a pedagogy in which students learn mainly within the studio environment. The two central aspects of architectural education; architectural design and building construction; are taught in very different ways in normative architectural education and in design/build studios. In normative education building construction is taught in a lecture format with little testing of applied knowledge. Similarly, architectural design is developed mainly in the studio environment through use of drawings and modeling tools. The student works out a design problem in isolation and in an abstract manner. Design issues are dealt with in critique format with professors and visiting critics. In design/build studios, the student works collaboratively as part of a team, in a full-scale environment. Issues of design and construction are dealt with together in real time, as design decisions affect building construction and vice versa.

Design/build based studios present advantages to all involved members. Students are given an environment in which to apply their knowledge of design and construction. They are given the opportunity to work collectively as part of a team on an actual project, mimicking the professional architectural office environment. They build relationships with the professional community through daily interactions requisite to the project. They gain valuable real-world experience, enhancing their employment potential in architectural practice.

Community Development Potential in Design/Build Programs

Communities benefit as their project needs are met. Often the community client receives financial assistance from the university's project leader through the grant application process or fundraising activities, assisting with materials costs. The cost of construction labor is eliminated or greatly reduced through the contribution of unpaid student builders. Relationships are borne between the client and the students, and often strengthened through time as the design/build studio maintains built projects and through visits of returning alumni.

The university is benefitted through this continued relationship as well. Often, community outreach aligns well with university mission statements. As design/build programs hold a certain level of autonomy from the university structure, the university benefits from these projects without the responsibility of direct interaction or involvement. The university benefits through high profile positive interaction with the community. Several universities note that students specify the design/build program as a central reason they selected their architecture program, suggesting a link between design/build programs and student enrollment.

The relationship between architecture, community development and academia can be strengthened through further emphasizing the aspect of *community* in design/build pedagogy. Students benefit from the design/build experience regardless of project location, as their primary benefit is to apply knowledge learned in the classroom. Yet, the concept of giving back to the community instills a social responsibility within the students that they carry with them after

graduation. When students are given the opportunity to work on a needed project within the community, they are linked to their geographical place, gaining sense of social responsibility that they would not otherwise be exposed to in the classroom environment. The concept that social justice and community development can be used as a pedagogical tool through the framework of design/build programs is central to this report.

Chapter 2 – Background

The Education of Architects

Historically, architects were involved in all aspects of the process of designing and constructing a building. Throughout the medieval period, the design of a building was flexible until the last stages of construction, often being worked out on-site by the architect and craftsmen in tandem. When a question regarding design intentions or construction detailing arose, relevant parties would gather at the site to discuss potential solutions in a group format. In this sense, design was historically a rather plastic, malleable process which went hand in hand with building. Carpenters, masons, and tradesmen were not relegated to strictly building, but were trained to make design decisions as well. Conversely, architects were not limited to the design process, but were active members of the construction process as well, creating a collaborative architectural experience.

In his text Learning by Doing, Carpenter considers the exploratory nature of historic architecture and construction practices, that "the journeyman became the master craftsman through mistakes, experimentation, and effort…..During the wander year (craftsmen) went to various building sites and performed different crafts to learn a well-rounded way of seeing a building" (Carpenter, W. Learning by Doing). When the Ecole de Beaux Arts was founded in Paris in the early 1800s, creating for the birth of formal architectural education, architects were trained within a limited skill set, focusing more on the creation of two-dimensional drawings to convey their design idea to builders in the field. "Construction was removed from the design

process. A two-dimensional analogy replaced the building itself; even the three-dimensional model was removed from the design process" (Carpenter, W. Learning by Doing, p. 6).

This shift in the educational process may be considered to be a pivotal moment in architectural history, essentially creating a formalized separation between the design and construction processes of architecture. Beginning with the creation of the Ecole de Beaux Arts, architecture became more of a specialized profession. Students began to be trained in a more abstract, less hands-on manner. The separation in training can be considered to have led to a breakdown in understanding of construction processes and techniques among young architects.

The Pedagogy of Architectural Design/Build Programs

Contemporary architectural practice is governed by the American Institute of Architects (AIA). Regulations set forth by the AIA impact pedagogical practice in academic institutions with five year Bachelor of Architecture degrees, the professional degree intended to lead to architectural licensure. "When the American Institute of Architects adopted its first Code of Ethics in 1909, the Code barred AIA members from engaging, directly or indirectly, in construction, effectively prohibiting its members from participating in design-build as a result" (Cushman, R. and Loulakis, M. 2001). This regulation resulted in the country's university architectural programs creating a pedagogy focused on the studio aspect of the profession. Because the AIA Code of Ethics prevented professionals from participating in design/build projects, there was no need to train architectural students to function in that capacity.

The AIA created a "'voluntary' code in 1980, which did not prohibit AIA members from participating in design-build" (Cushman, R. and Loulakis, M. 2001). In 1985, the AIA published the first edition of AIA design-build contracts. This new regulatory framework created an opportunity for design/build projects both at the professional level as well as within the academic environment. Since the mid 1980s, the presence of academic design/build programs has grown in the United States, although of the 53 universities listed as National Architectural Accrediting Board (NAAB) approved Bachelor of Architecture programs, only a small percentage offer design/build projects or programs. Indeed, neither the National Council for Architectural Registration Boards (NCARB) or the NAAB publish or keep track of a comprehensive list of academic architectural programs with some element of design/build, suggesting that although

design/build is becoming an increasingly more common element in architectural education, the professional industry and its regulating agencies have not kept pace with the trend.

Academic design/build programs remove design projects from the studio vacuum and push students to reconcile their drawings with real structures they can build, weld, wire, and plumb. They encourage students to work as part of collaborative teams, resolving conflicts, managing finances, and communicating with clients ("Learning from Construction" Architecture Magazine, September 1996, p. 145).

The Relationship Between Architecture and Community Development

In addition to academic design/build programs creating a more comprehensive academic experience for architectural students, design/build programs have the potential to create positive outcomes beyond the academic architectural department. Given a supportive set of conditions, they can benefit the college community as well as create positive community development where built projects are located.

In his text Learning by Doing, Carpenter tells us that "construction studios can offer students the opportunity for cross-disciplinary approaches and projects that reach out to the community groups who are in need. Students learn that architecture is a collaborative effort and not an exercise in isolation. Both in school and in practice, the ethic of giving back to society can be encouraged" (Carpenter, W. Learning by Doing, p. xi).

The goal of community development is to improve the quality of life in the community. Architects hold the potential to create community betterment and build community assets through their work. A focus on a more socially responsible, community based design process in academic programs can develop future practitioners with a core set of values focused on building stronger, healthier and more vibrant communities through their work. The connection between architecture, community development, and academia can be made stronger through shared vision.

The K-State Design + Build Protocol Committee

Relatively few documents about specific academic design/build programs have been published. Those that have tend to function as discrete case studies, describing specific university programs independently from one another. It is difficult to find a comparative analysis of design/build programs in general, but documents that discuss the structural organization of academic programs specifically are quite rare. One document that does begin to study conceptual frameworks for programs, although unpublished, is the K-State Design + Build Protocol Committee Report. In 2005, after the completion of several independent design/build projects at the university, Kansas State identified the need to begin considering how the university might approach incorporating design/build programs into its curriculum. The university formed a committee with the objective of reviewing current university-based programs at other institutions in order to establish a framework for potential application at Kansas State. The committee interviewed 'dozens of people from around the country at all levels of involvement with Design/Build at their institution' (K-State Design/Build Protocol Committee, 2005). The committee's resulting report provides a basic list of elements or "ingredients" inherent in the creation of a pedagogical program.

The Protocol Committee studied and discussed elements that they believed to be requisite for the creation of academic design/build programs. The committee understood that in order for a university to begin a design/build program, it needed to first understand how each element fit into the host university's bureaucratic structure. Therefore, the document is valuable in that it identifies structural elements requisite in design/build programs, and considers how the Kansas

State University College of Architecture, Planning and Design might approach each element, learning from other universities with established programs.

The structural elements identified by the committee include: identifying benefits for the creation of the program; pedagogy; institutional structure; liability and insurance; funding vehicles; student participant qualifications; and faculty advisor qualifications. The K-State Protocol Committee's report is invaluable to this report in that it provides a base conceptual framework for academic design/build programs. In addition to the structural elements identified by the K-State Protocol Committee, larger questions of program autonomy and focus on community development are important to the intent of this report to identify the organizational framework and understand the contextual nuances of architectural design/build projects. The following summary presents key findings of the K-State Protocol Committee and the application of those findings to this report's case studies.

Identifying Elements of Academic Design/Build Programs

Benefits for the Creation of the Program

The Protocol Committee identified several benefits associated with the creation of a design/build program. According to the committee, "The most common reasons given to support a design/build curriculum are: outreach to the community through service; promoting a positive, high profile image for the college; and the potential for short term donations and longer term alumni gifts (to the college)" (K-State Protocol Committee, 2007). It is believed that an understanding of the comprehensive benefits for the creation of a program would require an analysis of benefits to all parties involved in the process, including indentifying benefits to participating students, to the university, and to the community client.

Design/build based studios present advantages to all involved members. Students are given an environment in which to apply their knowledge of design and construction. They are given the opportunity to work collectively as part of a team on an actual project, mimicking the professional architectural office environment. They build relationships with the professional community through daily interactions requisite to the project. They gain valuable real-world experience, making them highly employable to architectural professionals.

Communities benefit as their project needs are met. Often the community client receives financial assistance from the university's project leader through grant application assistance or fundraising activities, mediating the cost of construction material. The cost of construction labor is eliminated or greatly reduced through the contribution of unpaid student builders.

Relationships are borne between the client and the students, and often strengthened through time as the design/build studio maintains built projects and through visits of returning alumni.

The university is benefitted through this continued relationship as well. Often, community outreach aligns well with university mission statements. As design/build programs hold a certain level of autonomy from the university structure, the university benefits from these projects without the responsibility of direct interaction or involvement. The university benefits through high profile positive interaction with the community. Several universities note that students specify the design/build program as a central reason they selected their architecture program, suggesting a link between design/build programs and student enrollment.

Pedagogy

The Protocol Committee report notes that most design/build programs have similar pedagogical approaches and student learning outcomes, including:

- •Consensus-based decision making process
- •Collaborative construction work, with teams leading various aspects of construction
- •Leadership
- •Real-world intensity
- •Positive effect on the community
- •Creating a sense of social justice in students

This list of pedagogical approaches and outcomes matches those articulated by Carpenter in Learning by Doing. The question of pedagogy became central to the case study analysis, as program leaders were asked to identify their pedagogical goals and student learning outcomes.

Liability and Insurance

In general, students enrolled in universities are provided with some extent of health insurance and liability insurance for protection in the event of an accident on college property. However, as design/build projects are typically constructed off-campus, and involve student participation in building construction, a physical and potentially hazardous activity, issues surrounding insurance protection become unclear. "A design/build program, because of the construction, brings a number of legal and liability issues not normal to the education of students and potentially brings more liability than found in the parallel design studios" (K-State Protocol Committee, 2007). As such, it would appear that issues surrounding liability and insurance could potentially prevent a university from incorporating a design/build program. In addition, if a university did allow design/build projects, it is believed that the scale and scope of a project directly impacts the liability issues that may surround it.

Student Participant Qualifications

As design/build projects are by nature team endeavors, it would appear that an optimal team size would be identified by program leaders. As this type of learning environment is potentially significantly more complex than its studio counterpart, it would also appear that

student participants would be required to meet a set of qualifications. The question arises of how students are selected to participate in these studios. The Protocol Committee describes the issue of selecting students for participation:

Design/build is not a standard studio assignment and may not be suited to all students. The success of the studio is built upon assembling a team of students, all of whom are team-oriented players, who have either the ability or interest in this type of activity. Therefore, this (type of) studio should be considered a privileged opportunity for which students must apply. Selection should be competitive, (and should be) based on: design talent, problem solving and creative thinking, ability to see and work toward accomplishing the "big picture", and (participant students should) be folks with a history of being diligent, over-achievers. It is important that a certain percentage of the studio have some construction experience, but not necessarily all of them (K-State Protocol Committee, 2007).

Established design/build programs exist and function in a variety of contextual environments, with a range of enrolled architecture students and offering a variety of academic degrees. As such, it is believed that program leaders would have individual standards for selecting students for enrollment in this type of course.

Faculty Advisor Qualifications

The Protocol Committee questioned the necessary level of experience of program leaders. The committee concluded that requisite faculty qualifications would be determined by the size and scope of the design/build project.

> Small projects with a specific focus involving a single discipline accomplished during a short duration, possibly an intersession, may require minimal faculty expertise especially if other entities are used to acquire needed approvals of the plans. On more complex projects, it would be desirable for faculty to be practicing designers with prior (knowledge of) construction methods and administration expertise (K-State Protocol Committee, 2007).

The concept that program leader experience is directly related to project scope will be explored and tested in the case studies. In addition, research will be expanded to include the question of how faculty members get involved in such projects, and the idea that it takes a certain personality type to take on these endeavors will be explored.

Level of Integration or Autonomy Within the Institution

The Protocol Committee identified two opposing models for academic design/build programs: one, inside the university system, with internal funding through the college's budget structure; and two, independent corporations that work separate from, yet in parallel to, the

university. "It must be understood that (the success of) a design/build studio is dependent on its own autonomy to operate in the outside world" (K-State Protocol Committee, 2007). This statement addresses the funding, budgetary and frequent spending requirements of design/build studios which tend to be ill-fitted for typical institutional financial structures, in particular. In addition, these programs take students outside the traditional classroom setting, creating a set of conditions which may not be suited to the main architectural curriculum, and certainly requiring some extent of autonomy from the institution. "Because such a program of real construction must, generally, be run at the speed of business rather than at the velocity of institutional bureaucracy, a certain program sovereignty of financial planning, management style and trust will be obligatory" (K-State Protocol Committee, 2007).

In addition to the two conceptual models proposed by the committee, there appears to be a potential third model, of special projects, with external funding and organizational structure specific to individual project needs, on a case by case basis. In this model, the architectural department completes projects as opportunities arise. As project parameters vary with disparate projects, the organizational framework and financial considerations must be flexible.

Established programs were selected for case study analysis specifically because they appeared to fit one of the three models. The Rural Studio and the Neighborhood Design/Build Studio appeared to work within the university system. The University of Kansas's Studio 804 appeared to function as an independent (nonprofit) corporation. The Boston Architectural Center and K-State appeared to manage disparate design/build projects through special projects programs.

Design/Build Programs as Vehicles for Community Development

Literature on design/build programs speaks to the idea of community betterment as an outcome of this type of academic project. Indeed, the Protocol Committee described 'creating a sense of social justice' as a desirable pedagogical outcome of design/build programs. The current limited literature on design/build education does not describe the mechanism for precisely how programs should incorporate community development. Therefore, the means by which programs facilitate community development and develop a sense of social justice amongst participating students will be explored during the research process.

Conclusion

The value of the K-State Design + Build Protocol Committee does not necessarily lie in its completeness, but in the fact that, perhaps for the first time, a university began to study the underlying structure of academic design/build programs. The structural elements of: benefits for the creation of the program; pedagogy; liability; student participant qualifications; faculty advisor qualifications; level of program autonomy; and the additional community development mechanism will be used to frame the case studies. The seven identified structural elements became the basis for research questions for program leaders, with each element transitioning into a question.

Chapter 3 – Research Methodology

This research project consists primarily of a case study analysis of five established academic design/build programs, including the University of Washington's Neighborhood Design/Build Studio, Auburn University's Rural Studio, the University of Kansas's Studio 804, the Boston Architectural Center's Special Projects Program, and Kansas State University's Kansas Project Solar House. These programs were selected as case studies due to their positions as established design/build programs functioning within American universities. They exist in a variety of contextual environments, from economically disadvantaged rural Hale County, Alabama, to the thriving urban neighborhood of Boston's Back Bay. Additionally, several programs state community betterment as an objective central to pedagogical outcomes. Each program was carefully analyzed in order to understand each program's underlying structural framework.

Following guidelines set forth by researcher Robert Yin, the methodology for creating the case studies followed three steps:

1) Review of available published literature on each program.
2) Interviews with key individuals in each program, addressing questions related to each of the seven structural elements identified by the K-State Design + Build Protocol Committee.
3) Synthesis of information collected to determine commonalities in structural frameworks and identify community development mechanisms used.

The review of available published literature of the five programs allowed identification of which of the three conceptual models each program appeared to work within. The programs that seemed to be most embedded within architectural curriculum were the University of Washington's Neighborhood Design/Build Studio and Auburn University's Rural Studio. The program that appeared to function most purely as a nonprofit was the University of Kansas's Studio 804. The two universities that appeared to conduct individual design/build programs as the opportunity arose through a special projects program were the Boston Architectural Center and Kansas State University.

After the programs were selected and identified as behaving within the conceptual framework of one of the three models, a questionnaire was developed in order to guide an open-ended interview process of program leaders. Although the most desirable research method would have been to conduct personal interviews, given that the five selected programs are located across the continental United States, and given the time constraints of the project, the author was limited to conducting interviews mainly by telephone. Occasionally, follow-up questions were conducted via email or a second telephone interview. Program leaders at the Boston Architectural Center were interviewed by telephone and in person.

Analysis was used to identify commonalities within the structural frameworks of the programs as well as contextual nuances. Additionally, the case studies were used to identify the factors within program models which appear to be the mechanisms for instigating community development where the projects are built.

Chapter 4 – Case Studies

Case studies have been organized to align with the three conceptual models for implementing design/build in academia. The first conceptual model is one in which the case study appears to be integrated into the university's main architectural curriculum. The University of Washington's Neighborhood Design/Build Studio is led by Steve Badanes, who was interviewed as part of the research process. Auburn University's Rural Studio is led by Andrew Freear, program director. Danny Wicke, faculty member, was interviewed. The second conceptual model is one in which the academic design/build program appears to function as a nonprofit organization. The University of Kansas' Studio 804 was selected as a case study, as it is an established and well-known example of a design/build program as independent from the university. Dan Rockhill leads Studio 804 and was interviewed for this process. The third and final conceptual model is one in which the design/build program functions through special projects. Kansas State University has completed several independent design/build projects over the past several years, perhaps most notably the Kansas Project Solar House, the university's entry into the Solar Decathlon design/build competition in 2007. The Kansas Project Solar House was led by R. Todd Gabbard, who was interviewed. The Boston Architectural College has fairly recently established an ongoing special projects program, which is led by Gabe Bergeron, who was interviewed. Case studies have been analyzed to identify common and distinguishing factors of each university's design/build program.

Integrated Into Architectural Curriculum

Neighborhood Design/Build Studio

Steve Badanes, Howard S. Wright Endowed Chair

University of Washington

Department of Architecture

The Neighborhood Design/Build Studio is an award-winning studio offered by the

Department of Architecture at the University of Washington where students design and

build small community projects for Seattle-area nonprofit groups. Architecture graduates

and undergraduates in their final year gain experience with clients, public agencies,

material and assembly details, and hands-on construction while working to benefit people

in the greater community (University of Washington, 2010).

The studio is led by Steve Badanes, a practicing architect and "founder of Jersey Devil,

an architectural firm perpetuating the tradition of medieval craftsmen. The firm is comprised of

skilled craftsmen, architects, inventors, and artists committed to the interdependence of building

and design" (NDBS, 2011). He is interested in an architectural work that deals with community

development and social equity. Badanes's roles in the NDBS process "are those of facilitator,

technical advisor, and advocate for the client" (Expanding Architecture, p. 253). Though the

course spans the 11 weeks of the spring semester, Badanes spends the fall semester arranging for

the project, completing required paperwork, and assisting the client in securing funding for the

purchase of materials. This organizational structure allows the students to become quickly

oriented to project parameters and set to begin the collaborative design/build process at the outset of the spring semester.

Project selection has proven to be an element of the process which directly affects potential success. "It's hard to find a project that's ready to go in the spring (by April 1st) that is the right size, budget, scale, and degree of difficulty for an eleven-week project" (Badanes, 2011).

The Neighborhood Design/Build Studio has completed a design/build project every spring semester since 1994. The University of Washington's Department of Architecture has a strong history of incorporating design/build into the program curriculum for over thirty years, and design/build has been cited as a main reason that incoming students select the University of Washington.

As a course which is fully integrated into the main curriculum, the NDBS results in specific learning outcomes, including the following (per NDBS website):

A. Collaborative, consensus building experience
B. Learning-by-doing and real-world designs
C. Development of communication skills
D. Redefinition of values- community service/commitment

The Neighborhood Design Build Studio directly introduces students to the concept of social architecture, of design which exists not merely for itself but very directly to benefit the greater good.

The spring semester begins typically begins with sixteen students enrolled in the studio. The course is open to eight graduate students and eight undergraduate students, in their final year of study. Although enrollment is capped at sixteen students, Badanes notes that the ideal size for design/build courses is ten to twelve students. "At a point approximately three weeks into the eleven week project, the group begins to function as a team or small design/build office" (EA, p. 253)."For the sake of efficiency, the class breaks into groups during the construction phase. Groups are usually self-selected; however (they) all work together on big items like concrete pours, and students are encouraged to spend time on all aspects of construction to gain as much expertise as possible…students are responsible for material procurement, fabrication and scheduling" (Badanes, 2011). Badanes and his assistant work on site, alongside the students.

A strong focus of the NDBS is craft. Student use of power tools is limited, for both safety as well as because manual tools both require students to think while they act, and provide the opportunity for correction. For example, they do not use nail guns. Badanes has the students put everything together with screws because "they have reverse" and allow for easy correction of mistakes.

Issues of insurance and liability for students participating in the construction process are addressed at the institutional level. At the outset of each project, Badanes contacts the University of Washington's risk management office, which in turn provides him with a certificate of insurance to cover the course. In addition, participating students have personal insurance through the university, which functions in a similar manner to field trip insurance.

The NDBS functions in an interdisciplinary manner, in that construction management students and architecture students work together. In the future, Badanes would like to involve UW landscape students more directly in the design/build process. The fact that projects are interdisciplinary demonstrates a commitment between construction management and architecture departments and is suggestive of a certain level of community development within the campus community. This collaboration, combined with the strong sense of community service and commitment to social justice inherent in the projects themselves, is indicative of a design/build model which holds great potential for community development both on campus and within the Seattle area.

Badanes believes that it is "more efficient to work closer to home, where you can be more productive, save energy, and build community credibility with each new project in the same geographic area" (Badanes, in Expanding Architecture, p. 248). As described in Expanding Architecture, "it is important for the students to complete the project, so (Badanes) selected something (the team) can finish in the eleven weeks of spring quarter. Only nonprofit organizations are eligible to be clients for the spring studio project." One major stumbling block for projects is the financial investment clients must make for their building. Funding for

materials is secured by the client, and is often covered via grants through Seattle's Department of

Neighborhoods. This approach is interesting, as a relationship has formed between the Studio

and the Department of Neighborhoods based on mutual success of program projects and funding

grants. When clients express difficulty in the grant process, Badanes often provides assistance

during the application process. "Budgets range from $5000 to $20000" (Expanding Architecture,

p. 249).

Rural Studio

Andrew Freear, Director

Danny Wicke, Outreach Instructor and Director's Assistant

Auburn University

School of Architecture

In 1993, two Auburn University architecture professors, Dennis K. Ruth and the late Samuel Mockbee, established the Auburn University Rural Studio in western Alabama within the university's School of Architecture. The Rural Studio, conceived as a strategy to improve the living conditions in rural Alabama while imparting practical experience to architectural students, completed its first project in 1994. In 2000, Andrew Freear was hired as a thesis professor and upon Mockbee's death, succeeded him as director while continuing to teach thesis. Under his guidance the focus has shifted from the design and construction of small homes to larger community projects (Rural Studio, 2010).

Danny Wicke acts as outreach instructor and assistant to Andrew Freear, director of the Rural Studio. As both faculty member and alumni of the program, he has a unique perspective of Rural Studio. According to Wicke, the Rural Studio functions as an off-campus program, two and a half hours driving distance away from the Auburn University campus. As part of the School of Architecture, the program functions as a satellite studio. The program is highly autonomous from the institutional organization, yet the university handles operations and maintenance costs for the portion of the program located on university-owned property.

Students are selected to participate in the Rural Studio through an application process. Every potential student submits an application, essay, and portfolio. Application packages are reviewed by a selection committee comprised of faculty from both the main Auburn University architectural department and Rural Studio.

According to Wicke, liability insurance is covered by the University and functions as a blanket policy, covering students enrolled in Rural Studio courses. Alumni who graduate yet stay on at Rural Studio to build their design projects are enrolled in a course in order to keep them protected under the student insurance policy.

Rural Studio has explored the program's potential for interdisciplinary studies, yet finds the inclusion of students from different majors to be complicated due to the program's location in rural Alabama. Faculty members from different disciplines have difficulty traveling to Rural Studio to educate their students in a remote location. Likewise, Rural Studio faculty do not possess the necessary skill sets to educate students from different majors. In this sense, students outside of architecture are somewhat disadvantaged when working at Rural Studio. To compensate for Rural Studio students lack of exposure to other disciplines, program leaders work closely with a core group of consultants who are committed to visiting the program to participate in critiques as well as assist with special technical issues pertaining to the projects. In this sense, although students are not able to work collaboratively with Auburn University students from other disciplines, they do have the unique opportunity to work alongside professionals from other fields.

Rural Studio has three types of students, with corresponding pedagogical objectives. 13-16 students in their third year of the Auburn University architectural program spend one semester of the academic year at Rural Studio. Although the third year group has traditionally completed an individual residence with eclectic design liberty, they are currently working on an ongoing project focusing on making the Rural Studio property more sustainable. Wicke believes when this specific project is complete, the third year students will likely return to the annual construction of a single family house.

Outreach students spend one year working on the 20k House, which the program describes as "an ongoing research project at the Rural Studio that seeks to address the pressing need for decent and affordable housing in Hale County" (Rural Studio 20k House, 2011). A central objective of the program is to build an affordable housing prototype for rural economically disadvantaged residents with a total materials and labor cost under twenty thousand dollars.

The 20k House functions in a manner similar to an ongoing special project program, or a continuing educational program. It gives participants from diverse backgrounds the opportunity to work in the Rural Studio environment for a short duration of time. Rural Studio has administered the 20k House project since 2005, and is currently completing its tenth house. Wicke states that the 20k project is an opportunity to investigate potential responses to housing issues in rural Alabama.

10-12 students spend their entire final year at the Studio. These students spend their thesis year designing, and tend to stay on an additional nine months to a year constructing the project. The thesis program has evolved to focus on larger scale public buildings, although the opportunity does still exist for thesis students to work on the design and construction of a single family home. According to Wicke, the completion of an individual house affects one family substantially, but with larger scale projects, the Rural Studio has the ability to engage with the community on a far bigger scale.

Thesis students begin the year working collaboratively in continually shifting groups. The groups work in a charette format focusing on a series of design projects. Through the process of exploring different architectural typologies and with different students, they learn who they work well with, which students have similar design intentions, and typologies that they would like to explore further. In this sense the student teams are self-selected in a gradual process. By the time permanent teams are formed, the students have chosen their client and have developed a sense of ownership for the project.

Originally, Rural Studio faculty and students sought out projects from investigating community need, yet as the program has been established for eighteen years and developed a permanence of place, they are often approached by the community with potential projects. Through their broad experience with design/build, program leaders have a solid understanding of what is manageable in terms of project scope and size. In addition, projects are selected based upon their potential for strong learning opportunities. A lot of time is spent on teaching students how to communicate with community members.

"Mockbee present(ed) architecture as a discipline rooted in community and its environmental, social, political, and aesthetic issues and show(ed) students that their goodness is more important than their greatness; their compassion more eventful than their passion" (Oppenheimer Dean and Hursley, 2002). This tradition of community engagement and the production of work which benefits the greater good continues today. According to Wicke, the pedagogy of the Rural Studio focuses on teaching students "how to be better architects and with an ethic that is culturally sensitive and ethically in line with what architects should be doing." He hopes that the students are consciously engaging in community development, but does acknowledge that the students appear to be so entrenched in the process of constructing a building that there is not much time for reflection. Wicke notes that students graduate with a skill set not available in many educational institutions, and alumni wish to continue to use these skills in their professional lives. In addition, there is a great desire amongst Rural Studio alumni to work in an environment supportive of design/build and community engagement.

Rural Studio is somewhat unique in its self-evaluation. According to Wicke, "the ability for Rural Studio to be a success is to self-criticize and to evolve and try to learn and every year get to closer to running at 100% potential. The program is continually evolving. Programs that are really successful are those that are (continuously) reflective."

Design/Build Programs Functioning as a Nonprofit Organization

Studio 804

Dan Rockhill, Executive Director

J L Constant Distinguished Professor

University of Kansas School of Architecture and Urban Planning

Studio 804, a graduate-level design/build studio offered through the University of Kansas, has run continuously since 1995. Led by architecture professor Dan Rockhill, the program has built 16 projects, completing the design and construction of one project each academic year.

According to Dan Rockhill, Studio 804 originated out of his realization that architecture had become fairly shallow, that the process of architecture incorporated very little design any more, and that much of this stems from our culture. Dan had been teaching a final semester graduate design studio and found that it was difficult to get students motivated at the end of their academic career. By chance, one year he took the class into the field and found that they responded quite well to getting out of the studio environment and into the field. "They were drunk on the experience, really hungry for any tactile experience that would make them better architects" (Rockhill, D. 2011).

Studio 804 has evolved to become a comprehensive design/build studio rooted in the values of creating well-designed, sustainable affordable housing in and around the community of Kansas City, Kansas.

Each academic year, the students enrolled in Studio 804 completely design and build a full scale project, normally a single family residence, during the fall and spring semesters. The project is chosen by students, and the entire project is a group effort, rooted in a democratic process. At the beginning of the program, students identify areas of interest in which they would like responsibility for the duration of the project. The entire group meets every day to present research, designs and proposals on those interests in an effort to come to an informed consensus on design.

Students are responsible for every aspect of the process. These duties include, but are not limited to, site selection and acquisition, maintaining a budget, codes, materials specifications, donations, MEP, structural calculations, construction documentation, construction, sustainability, public relations, etc. (Studio 804 Capstone Info, 2011).

The course begins with an enrollment of approximately 24 students, which tends to decrease throughout the academic year as students drop out. Rockhill finds a team size of 16 students to be optimal.

Although Studio 804 is offered as a course through the University of Kansas, it is unique in its level of autonomy from the academic curriculum. Rockhill's position has a certain duality,

as he is a faculty member within the department of architecture, yet also independently heads the Studio, which operates as a 501-(C)(3) nonprofit.

Most of Studio 804's projects are built on speculation and, in general, sold to private clients post-construction. Prior to 2007, the studio was completely dependent upon nonprofits and community development corporations (CDC's) for project funding. Early on, Rockhill devised a funding mechanism within which CDCs would essentially agree to finance the construction cost of a project, which would be repaid, with interest, upon its sale. As students construct the projects, money is saved on labor costs as well as through careful budgeting. By 2007, Studio 804 had earned enough money to become financially independent, funding the past several projects without external financing.

Unfortunately, due to the current status of the national economy, the two most recent Studio 804 houses remain unsold as of the spring 2011 academic semester. As such, the 2011 project is being conducted through the University of Kansas, with funding for the proposed Center for Design Research raised primarily through institutional mechanisms.

Rockhill purchases liability insurance for the design/build process through the 501-(C)(3). In addition, the state of Kansas does not require residential construction documents to be stamped by a licensed architect, thereby reducing personal liability to Rockhill, as an engineer stamps the drawings.

Students are responsible for providing Rockhill with a certificate of insurance at the outset of the course. According to Rockhill, there exist any number of scenarios for students to obtain liability protection, although a typical mechanism is for students to purchase a six month carpentry policy through insurance companies.

Studio 804 encourages community development in the Kansas City area through working closely with neighborhood associations and community development corporations to identify locations for and scopes of projects. In addition, the studio hosts open houses, barbeques on the construction site, as well as impromptu gatherings between students and community residents. Rockhill prides himself in engaging these communities in a way that enables community residents and students to develop an appreciation of one another. This interaction is incredibly important, as it fosters an understanding within the students that architects do not work in isolation; that their projects impact not only the site, but the greater community. In addition, results from the interviews indicate that creating opportunities for students and community residents to interact builds empathy and relationships between the college community, local residents, and neighborhood associations.

Rockhill's students typically originate from white suburban middle-class families. It is important to him that the students become familiar with the socioeconomic context of the urban core, understand the struggles faced by residents in the urban core, and that they approach those socioeconomic issues and deal with them in their design/build projects.

All of these elements are wrapped up in a very important concept: that a stronger social agenda needs to be addressed within the architectural education. Rockhill believes in the connection between three elements: neighborhood, education, and the urban core. As such, he intentionally selects projects within neighborhoods that are in transition and marginalized.

The concept of social agenda is directly infused within course curriculum, though in a sublime way. The class meets all day, six days a week. They spend a lot of time talking. Rockhill notes the importance of the students even having the opportunity to be in a city that's not quite as secure as their own. He values that his students find comfort in regional foods and are exposed to a variety of cultural experiences throughout the construction process. As an example, on one Studio 804 project, a non-English speaking neighborhood resident visited the construction site daily, selling tamales to the students, creating the opportunity for students to develop an appreciation that there is a "fabric of life out there to explore" (Rockhill, D. 2011).

Design/Build Programs Functioning as Special Projects Programs

The Boston Architectural Center

The Boston Architectural Center fosters a mutually supportive academic and work experience, focusing on the increased development of both areas of knowledge. Therefore, the BAC requires students to do concurrent academic credits and professional work, called practice credits. Students must demonstrate to the college their continued professional progression in the field of architecture, and therefore may not simply continually work at one level in a professional environment, but also must demonstrate an increased skill level. By graduation, students generally hold positions of leadership in offices, leading teams or acting as projects managers in the professional work environment.

The BAC's Special Projects Program was implemented as a result of current economic conditions in the field of building and architecture, and has therefore run continuously for nearly two years. The main objective of the Special Projects Program is to provide students with an opportunity to gain required work experience at a time when the opportunity for students to obtain gainful employment in the city of Boston is limited. As such, the college creates a simulated work experience for students, who work with actual clients selected from the community. Project parameters are decided by the client and the college, and students are given a set of required deliverables at the outset of the project. In this way, the Special Projects Program functions in a similar manner to an office, with a real client, a set of objectives, and a specific timeframe for project completion.

The Special Projects Program is led by Gabe Bergeron, director of the program and BAC alumni. During his tenure at the BAC, Gabe has expanded a list of supportive clients in the community. Approximately one month prior to the beginning of the semester, Bergeron creates advertising for the project to notify potentially interested students. He conducts an interview process by which he selects student participants, and sets up the parameters and objectives of the project. In this way, the Special Projects Program is unique in that student selection is highly competitive.

Bergeron's role is to expand the community service side of the BAC program. He implements this initiative through a C-level studio called 'Community Design'. The Community Design course is considered an elective, and is offered each semester, taught by Bergeron.

The student team is assembled with three tiers of academic levels- a leadership level, a middle level and a beginning level. This is beneficial as it allows for the continued participation in the community design studio environment from (theoretically) first year to seventh year. It also creates an inherent mentorship program.

Community design projects have the opportunity to become interdisciplinary, depending upon specific needs of the projects. The BAC offers programs in Design Studies, Landscape Architecture, Interior Design, and Architecture. When the need arises, a representative from the ancillary program joins the community design studio as a representative.

Project teams are composed of the beneficiary community group or agency, the team of students, and the practitioner. This is a fascinating framework as a practicing architect from the community signs off on (stamps) the construction documents (if included in the set of deliverables) and essentially takes on the liability of the project. This practitioner is not necessarily a regular BAC faculty member, and is therefore entering the academic environment often for the first time and in turn learns from the experience. This adjunct faculty member is also given a small stipend for the semester.

The Special Projects Program was created to essentially fill a hole in the field created by the weak economy, but may in fact be a more valuable and unique experience as projects versus the work experience gained via employment in the architectural firm or in a related field. Certainly the special projects allow beginning students the opportunity to work directly with community agencies and community leaders, as well as exposing them to direct collaboration and teamwork with upper-level students and an interdisciplinary team. This type of exposure to a wide variety of individuals may not necessarily occur in responsibilities of beginning students just entering the work force.

Another interesting characteristic of the BAC program is that whether or not students participate in the building of a structure depends on the determined set of deliverables for the semester the student is enrolled in the community design course. Very often, the goal is to get visioning materials prepared so the community agency or nonprofit can proceed with a funding campaign and then, perhaps in the future, build. These projects very much act as design/build projects. BAC's projects may generate a greater level of community development than schools

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which must focus heavily on one project, whereas BAC is currently working on twenty community projects and approximately five competitions. The concept that a project does not necessarily need to be built in order to teach students about the process as well as generate community development is interesting. When the build portion of design/build is not required, students can focus more on conceptual thinking and the community visioning process; central to the core of community development. The applied learning in this case is obtained through real community dialog and relationship building, without necessarily physical building.

Given the fact that the BAC is working on a large number of community projects simultaneously, Bergeron believes the BAC may become a licensed and insured entity at some point in the near future, allowing the BAC to have a standing community design/build program.

Kansas Project Solar House – 2007 Solar Decathlon

R. Todd Gabbard, Associate Professor

Kansas State University

College of Architecture, Planning and Design

Kansas State University has a history of approaching opportunities for design/build as

individual special projects. As such, each project is handled in a unique manner. It would appear

that the university has in recent years begun to seriously consider beginning a formalized

institutional structure for organizing and implementing design/build projects conducted through

the university, as evident in the 2007 Report of the Design + Build Protocol Committee,

conducted by professors Tony Barnes, Bob Condia and Neal Hubbell. One such project was the

Kansas Project Solar House, the Kansas State University 2007 entry into the biannual Solar

Decathlon competition. Per the US Department of Energy,

> The U.S. Department of Energy Solar Decathlon challenges 20 collegiate teams to
>
> design, build and operate solar-powered houses that are cost-effective, energy-efficient,
>
> and attractive. The winner of the competition is the team that best blends affordability,
>
> consumer appeal, and design excellence with optimal energy production and maximum
>
> efficiency (Solar Decathlon, 2011).

The Kansas Project Solar House came about through the interest and support of Jim

Ploger of the Kansas Energy Office, who believed that the state should be represented in the

Solar Decathlon. Ploger approached K-State architecture professor R. Todd Gabbard, a fairly

new member of the K-State faculty at the time. Gabbard's interest in design/build stemmed from his own architectural education, where he worked on a series of small design/build projects, as well as in his own thesis, through which he explored developing a park space for a community in Florida.

Ploger's enthusiasm led Gabbard, architecture professor at K-State to meet with Ruth Miller, engineering professor and organize the project. Interested universities are required by the Department of Energy to write a proposal for the competition, which was completed by Gabbard and Miller. The USDOE requires the proposal to focus on methodology for successful completion of the project, and does not require a design proposal at the time of application. This process allowed Gabbard and Miller to create the framework for the project prior to student involvement.

Once K-State received approval to participate in the Solar Decathlon, Gabbard and Miller organized two vehicles for student participation. Gabbard taught four design studios over the course of the two-year project, including enrolled students in those courses as participants in the project. Mechanical and electrical engineering students enrolled in Miller's courses participated in a similar manner. One business student became involved, focusing on financing and budgetary concerns. The professors also generated a mechanism for students not enrolled in their courses to participate, through the creation of the Project Solar House, a student organization. Essentially a student club, Project Solar House could formally seek funding through the K-State Foundation, the Kansas Energy Office, and private sponsors, beyond the approximately $100,000 allotted to

the university through the Department of Energy. Additional material donations were made from community businesses.

This project is somewhat unique to design/build programs in academia, in that it was both entrenched in curriculum and open to outside participation. In addition, although it was not rooted in community development, it was highly interdisciplinary, building ties and relationships between several departments on campus.

Team size for the project became an important factor. As many different technical issues were involved in the project, Gabbard organized the overall project into teams, groups of students focusing on one element of the house, such as the roof or bathroom system. In general, over the course of two years, there were always at least two students working on a team, but not more than four. This approach allowed for close communication between student team members. Students broke into teams in a democratic manner, self-selecting and focusing on an element of the house that peaked their interest.

In order to keep control over the project, Gabbard and Miller held joint meetings, and worked with a committee of the whole. Overall decisions were always made in the formal studio environment. In addition, all students were required to serve as a liaison to other groups, creating an environment of constant consultation.

The number of students actively participating on Project Solar House ranged from just four, during the summer, to over sixty, enrolled in courses during the semester. Participating

students were in their fourth and fifth year of architecture, although in the final semester of the two-year project, third year students joined the team for the final push to complete the house prior to the competition.

Over the course of the two-year process, a large number of students contributed to the project, and as students were mainly working in either the Project Solar House organization or within the classroom environment, liability was not an issue. During the construction phase, the university purchased an insurance plan for the period of time they had to be insured. It appears that the insurance functioned as an umbrella policy, covering any student that participated in the construction process.

There were many logistical elements to the project, as the house had to be constructed in Kansas and then transported to the Solar Decathlon competition in Washington, DC. The team needed to secure a place to slowly work on the project. One of the faculty members at K-State knew a local developer in Manhattan, KS who owned an unused piece of property with an old warehouse. The use of this property allowed the team to work on the project at a location off-campus.

There exist several different types of institutional support for academic design/build programs. Kansas State University appears to offer benign support, allowing faculty to do what they think they should in terms of design/build projects. The dean has stated that a formalized design/build program is something that the college is aiming for, although the college needs to identify how a sustained program might fit within the academic curriculum.

The Kansas Project Solar House did not act as a generator of community development in the Manhattan, Kansas community. This is understandable, as at the outset the project held very specific objectives, including the design, construction and transportation of the house to Washington DC for the competition. The project scope was not planned to include the community. Interestingly, through the collaboration of Gabbard and Miller, two professors from different departments, the project did function in a highly interdisciplinary manner. In this sense, this special project did build community development within the college campus community, as relationships were created between the college departments, who continue to work together when the opportunity for new projects present themselves.

Chapter 5 - Findings

Through the review of available literature on contemporary academic design/build programs, three conceptual models appeared to emerge:

• programs which were entrenched within the architectural curriculum;

• programs which were autonomous from curriculum and functioned as nonprofit entities, and;

• programs which functioned as special projects within the college department.

The five programs were assigned to the model they appeared to abide by, information collected in the case studies allowed comparison of how the seven structural elements function within each model.

In addition to providing useful information about the intentions and operations of each program as described in the case studies, synthesis of the information revealed and highlighted new considerations as described below.

The Nonprofit Element

Surprisingly, nearly every program reviewed included some aspect of nonprofit activity. Initial research indicated that Studio 804 was the only program functioning as a nonprofit enterprise. Research demonstrated inclusion of several nonprofit mechanisms into most of the design/build programs studied. A program itself may function as a nonprofit or self-funded

entity, or it may budget allocated grant funding each academic year. Additionally, programs may explicitly selected clients from nonprofit agencies within the community. It was discovered that the programs which include a nonprofit mechanism also appeared to be solidly connected to community betterment. It is currently unclear whether the incorporation of a nonprofit mechanism is requisite to enduring community-based academic design/build programs.

Student Insurance and Liability Protection

It appeared at the outset that a central impediment to the creation of an academic design/build program would be issues relating to liability and insurance. Program directors spoke to the fact that this issue was resolved within the institutional framework, under student insurance policies, or the program itself would purchase a temporary construction or carpentry policy spanning the length of the project and covering an and all participating students under an umbrella plan. Each program identified a mechanism to provide liability insurance which worked within its given institutional framework.

Characteristics of Program Leaders

It was fascinating to discover that the personalities of each program leader appeared to be a major factor for both the creation of the project or program as well as its continued success. They all truly believe in the educational and social value of design/build and its benefits for students, the university, and community members. Through their programs or special projects, they expend tremendous energy and devote large amounts of time to the work, often beyond their responsibilities and workload as faculty members, and sometimes for no financial recompense.

They simply do what it takes to get the work done and keep students on schedule and within budget. In addition, these programs require a great deal of initial project organization, the responsibility for which falls upon the faculty leaders.

Need for Actual Client

It was discovered that the most successful programs tend to be those with actual clients for design/build projects. Whether they are community agencies or individuals, the incorporation of an actual client holds a great deal of value for the projects, forcing students to deal with more realistic expectations and schedules, more in kind to working in an architectural office. In addition, the presence of a client suggests work within a specific neighborhood, directly linking the program to the community, which is necessary for community development.

Assessment Tool

A design/build program which intends to function as a mechanism for community development needs to go into the initiative with a set assessment program for measuring success of the program and creates awareness for, and a level of, adaptability. The most enduring programs appear to include engendering a sense of social responsibility amongst students in their pedagogical outcomes.

Interdisciplinary Process

The programs which tend to incite the greatest level of community development in the geographic area also tend to create strong levels of bridging and bonding within the college community. In addition, when collaboration occurs within the university, there appears to be a

greater level of support for such projects, as the benefit is spread amongst several departments, creating a sense of joint ownership and pride.

Special Projects

Special projects seem to hold great potential for a high level of interdisciplinary collaboration within the college community. This may be due to the lack of a formal design/build organizational structure at the institutional level, therefore in a sense requiring faculty representation from different disciplines to pull together to complete the project. In general, special projects tend to include interdisciplinary collaboration between architecture, engineering and landscape architecture departments. At this time, it certainly appears that out of the three conceptual frameworks for academic design/build programs, that the special projects model holds the greatest capacity to generate community development on campus through bridging and bonding. In addition, the shared experience of the process creates a strong foundation of interdisciplinary relationships upon which to build future projects and joint work within the campus community.

Summary of the Conceptual Model

At the close of research, no singular model for academic design/build programs emerged as a clear model for replication. It appeared during the early stages of research that programs would likely fit three pure conceptual models: programs entrenched in architectural curriculum, programs functioning as nonprofits, and programs functioning as special projects. Through conducting the case studies of the programs, it became evident that programs do not behave in such a way. For example, those colleges that have completed special projects, such as KSU and

BAC, completed at least a portion of the project through an architectural design course, meaning at least a piece of the project occurred within curriculum. In addition, at the outset it appeared as though Studio 804 was unique in that it functions as a nonprofit, yet when delving deeper with research it became quite evident that a majority of programs are funded through nonprofit mechanisms. Therefore, it appears that academic design/build programs are highly contextual in nature and must fit in some way with university policy.

Nearly all reviewed programs are in some way nonprofit, do work in general within curriculum, have charismatic leaders whom work diligently and wear many different hats as directors of these programs, and all do demonstrate evidence of creating community development either on campus or within the geographic community. The strongest, most successful and enduring programs are those which make community service, social justice, or community betterment a priority. Those that include student learning outcomes of collaboration, participation in a democratic design process, and empathy tend to be the most successful.

Chapter 6 – Conclusion

In the studying of how academic design/build programs may act as vehicles for community development, five established university programs were reviewed to enable identification of commonalities within the structural organization of the programs as well as their contextual nuances; and the identification of the factors within those programs which act as mechanisms for community development.

Conceptual Model

A desired outcome of this research process was to develop a conceptual model for design/build in academia. It was discovered that a precise replicable model does not appear to be a viable option for universities wishing to implement this type of program, although the basis for this model, an underlying framework, is evident. The elements of the model are absolute, functioning somewhat like a skeletal framework. These pieces include:

•Identifying benefits for the creation of the program

•Determining pedagogy and student learning outcomes

•Identifying how students will be protected against liability

•Determining student participant qualifications

•Determining faculty advisor qualifications

•Determining the level of autonomy within the institution

•Identifying a mechanism for including community development as a program outcome

The framework may act as a guideline for universities to reflect upon desired pedagogical outcomes, to determine how such a program may align with the university's mission statement and within its institutional structure, and to think more deeply about how their academic program as a whole may work within their geographic communities in order to ensure that their projects are built not merely for the sake of giving students construction experience, but in order to satisfy a need in the community as well as create community betterment and a sense of social justice in their students. The responses to the skeletal framework are contextual, the pedagogical 'meat' of the programs which reflect locational context. Program leaders must reflect upon their response to the seven structural elements, and use those to determine with which of the three conceptual models their proposed program best aligns.

Research Limitations

A central limitation to this research project was the limited availability of published material on academic design/build programs in the university setting. Existing literature tends to focus on a specific program's body of work, or looks at individual projects in detail. There does not appear to be any published work linking these programs with their impact on community development. In this way, the most valuable information throughout this process was produced during the interview process.

Analyzing case studies of each program required not only understanding how program frameworks were structured, but also understanding how programs functioned in their given institutional, geographical, cultural and economic contexts. This process required a great deal of consideration and time during the research process, and created limitations in the scope of work

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which could be completed. In this sense, this research process potentially raises more questions than it perhaps answers and creates an opportunity for future research.

Future Research in Community Development

Academic design/build programs can serve as vehicles for community development. In these programs, community development can be a driving force, or a side effect. It is believed that if universities wishing to implement such programs into their pedagogy, community engagement must be infused as a central component to the structural framework. As community development has different meanings in disparate locations, the specific needs of a given community must drive the parameters of proposed design/build projects.

Several of the programs reviewed for this study do deal with community development explicitly, including the Neighborhood Design/Build Studio, the Rural Studio, and the Boston Architectural Center. Some miss the opportunity for community engagement, and yet others affect a certain level of community betterment, although such an outcome appears to be accidental and as such is not included in program pedagogy. Design schools do have a strong history of community engagement through theoretical design projects, but a much higher level of betterment can be achieved by incorporating construction into the process, to create a full scale built environment to serve a need within the community. One desired outcome of this study is to raise awareness among the design/build community of the potential strong connection between architecture, education, and community development. This type of pedagogical format gives students the opportunity to gain lessons within the community setting that will carry over into their professional environments.

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Survey of Existing Programs – Catalogue by Type

As academic design/build programs are not currently tracked through the National

Architectural Accrediting Board (NAAB), it is very difficult to determine which institutions

offer the opportunity for students to participate in design/build activities. Future research could

include surveying the fifty-three universities accredited by the NAAB to offer Bachelor of

Architecture degrees to determine which programs incorporate design/build into their pedagogy,

and catalogue programs by type into one of the three conceptual models. Research would

provide a comprehensive list of design/build activities within accredited architectural

universities.

Increasing Capacity for Understanding the Relationship Between Architecture, Academia and Community Development

Future research could include examining the extent to which design/build activities

increase the capacity for both the university and its counterpart community to understand what

architectural activities can do for the community's development and to what extent design/build

has the capacity to make the community a better place. This process has the potential to link

architecture to community development through the university.

Extent to which design/build guides an ethic of community development

Future research could solicit input from the community leaders and participant students

impacted by each of the design/build programs in this study. Their perspective would provide a

more in-depth understanding of how student-built projects benefitted their community and a

better understanding of the relationships between the host program and its counterpart

community, and enable the identification of the factors within those programs which act as mechanisms for community development. The identification of these factors will allow for the creation of a comprehensive conceptual model for community-based design/build programs in academia.

Future Questions to be Addressed

1. To what extent does design/build have a positive impact on the community to increase the capacity to understand and utilize architecture in community planning?

2. To what extent does design/build positively impact the university as a result of students interacting in the community, potentially providing opportunities for grants and community business partnerships?

3. To what extent does design/build come across as valuable to students, when community input in the architectural design process affects future architects by giving them a skill valuable for their future work?

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Appendix A - Research Questions

Part I: Structural Framework

A **Identifying benefits for creation of academic design/build program**

1. How did your university's design/build program begin?

2. How long has the program existed?

3. How many projects have been completed under the auspice of the design/build program?

B **Reflection upon desired pedagogical outcomes**

1. What are the student learning outcomes specific to your design/build program?

2. Is the design/build program interdisciplinary with related academic fields in your university?

C **Level of integration or autonomy within academic curriculum**

1. What are administrative and regulatory frameworks or restrictions within which the program operates?

2. Does the design/build program act independently of, or in conjunction with, or supplemented by, the main architectural curriculum?

D **Determination of optimal scope or potential scope of design/build projects**

1. If projects are selected from desired projects in the community, who determines which projects are selected?

2. What determines the scope and physical size of the project?

E   Identification of desired qualifications of design/build director (leading faculty)

1. What is the level of experience of the leader of the design/build program?

2. What are the required/desired qualifications of participating professors?

3. What motivates you as an individual to pursue this type of project? What does it take for you to do this work?

F   Identification of desired qualifications of student participants

1. What are the required qualifications for student participants?

2. At what level in their architectural education must students have reached prior to participating in design/build program?

3. Please identify student participant roles in the design/build projects.

4. What is the optimal size of the design/build team?

G   Funding

1. Please describe the process by which funding is secured for design/build projects

2. Who is the party responsible for identifying and securing project funding and budgeting?

H   Liability/insurance/worker's compensation

1. What is the mechanism used in your university to provide students with liability coverage when participating in design/build projects?

I   Contractual implications

1. Please describe the contractual implication between participants within the design/build program.

Part II: Design/build program as community developer

J   Level of Community Development on Campus

1. Is your program interdisciplinary? Do your projects incorporate work by students outside of architecture?

2. Has your program increased levels of bridging and/or bonding within your college campus community?

K   Level of Community Development Off Campus

1. It would appear that there is a potential connection between academic design/build programs and community development in the city and region within which the campus is located. Have you found that your design/build program has either functioned as a catalyst for, or enhanced community development in the college community and/or the geographic community in which your campus is located?