

House Divided: Challenges to Design/Build from Within

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INTRODUCTION

"A house divided against itself cannot stand."
-Abraham Lincoln ¹

There are approximately 100 design/build programs throughout the 123 NAAB accredited architecture schools.² Design/build education has certainly become a prevalent model but can the programs be sustained? Through an online survey³ of 43 faculty members involved in design/build education at 36 institutions, this article comparatively analyzes issues of: program integration, institutional support, and growth along with faculty roles and workloads.

The analysis of respondent answers yields several important findings that architectural faculty, students and administrators might want to carefully consider. In particular, the challenges to design/build at the program level and at the faculty level may lead to structural failures.

The primary challenge to programs is the lack of integration of design/build activities into the overall curriculum. In a majority of the programs surveyed, design/build activities (or courses) are elective rather than required. There is a question whether or not school administrations and/or colleagues fully accept design/build and value it as an important ingredient in the education of an architect? Ultimately, a lack of integration and lack of institutional support can lead to the marginalization of both the design/build program and the involved faculty.

Faculty challenges appear on many fronts. Design/build faculty maintain excessive workloads due to

the demands of managing construction projects on top of the required teaching, research, and service that are a part of their traditional responsibilities. In addition, the multiple roles that range from fundraiser to cheerleader to architect of record cannot be indefinitely sustained when these roles are magnified by the growing numbers of students and the ever-increasing scale of projects.

A frank discussion should occur within schools of architecture regarding the value of design/build. Structural deficiencies have to be addressed. And ultimately best practices must be established and enhanced with new models explored in order for design/build programs to be sustainable in these challenging economic times.



Figure 1. UL Lafayette students push solar decathlon home out of fabrication warehouse. Photo by Catherine Guidry.

"If you're going to do this you gotta pack your bags, kiss your wife goodbye, and go to war." -Samuel Mockbee⁴

Context

Design/Build programs in schools of architecture have grown at least threefold in the last twenty years since being resuscitated and popularized by Auburn's Rural Studio in the early 90's.⁵ Design/build programs are becoming even more important today as architects struggle to maintain their relevance in an expanding and ever-changing construction industry which often pushes the architect aside with new consultants and specialists. Kieran Timberlake and other research practitioners who engage in design-build and digital fabrication have called for a return to the architect as "master builder" in order for the profession to remain a central player.⁶

In addition, surveys have shown that our architecture students increasingly prefer a hands-on education serving their community.⁷ Whether it is for altruistic reasons or just the desire to get their hands dirty, they want to get out of the classroom and into their community.

Few question the importance of experiential, project-based, service-learning. Collaborative team skills, communication, leadership skills, and interdisciplinary practice, the benefits of service-learning, are also accrued through design/build teaching and experience. Most importantly, as Scott Wing in his essay *Sore Shoulders, Bruised Ethics*, says:

*"they provide an educational platform on which to present architecture as a complex structure of ethical positions and actions. As students confront material consequences and cope with physical exhaustion, struggle to reconcile the divergent missions of clients and classmates, and ponder the limits of time and money, they experience the act of construction as a process of 'doing the right thing.' Rather than a professor 'teaching' a predetermined code of conduct, ethical conduct emerges from the student's confrontation with difficult choices."*⁸

In this way, design/build projects directly address the NAAB criteria of collaboration, project management, leadership, legal responsibilities, ethical and professional judgment, and community and social responsibility.⁹

Survey

In order to gauge the similarities and diversity as well as the challenges among university design-build programs, an online survey (SurveyMonkey.com) was conducted over several weeks in the spring of 2011. The ACSA website and university websites as well as colleague acquaintances were used to assemble the list of possible respondents. Approximately 120 faculty members were invited to participate and they were allowed one month to answer the survey. The average time required to answer the twenty questions was 12.6 minutes.¹⁰ The entire survey and its results are included in the Appendix.

The survey represents 43 respondents, from 36 programs. (Occasionally, more than one faculty member per program responded.) This number encompasses approximately one-fourth of all accredited institutions.¹¹ And it includes approximately one-third of the total estimated design/build programs.¹²

Many respondents did not list their affiliated university. Some programs were identified as interdisciplinary, including engineering or construction students. Finally, some of the programs existed only for a brief time for temporary events such as Solar Decathlon biennial competitions.

The objective data from the survey supports the assertion that design/build programs have become a prevalent model for architectural education in our institutions. The average year which the programs were founded was 1999. The average number of students is 20 and the average length of design/build projects is 2 semesters (8 months).¹³

The average yearly cost of projects is \$60,595 and the total overall value of all projects is \$23,848,500! Based on the average age of each program the average total cost of each program's projects is \$662,458.¹⁴

Overall, 11,880 students have participated in these programs. If approximately 5,781 (2009) architecture students graduate per year multiplied by 12 years (average age of the programs) then 69,372 architecture students have graduated and approximately 17% have participated in design/build programs during their education.¹⁵

HOUSE DIVIDED

The survey suggests two areas of potential structural failure that may lead to the demise of design/build programs.

- **Program Challenges:** The lack of integration of the programs within the curriculum coupled with the lack of acceptance and support from administration and other faculty may lead to the marginalization of design/build.
- **Faculty Challenges:** The stresses upon faculty caused by excessive workloads, multiple roles, and expanding student numbers and project scope threaten structural collapse.

PROGRAM CHALLENGES

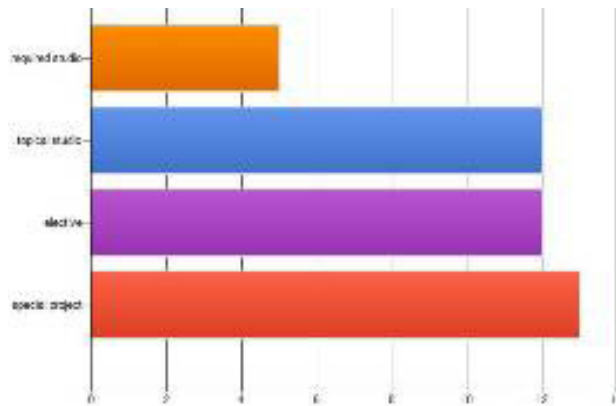


Figure 2. Chart- How is the curriculum structured? SurveyMonkey.com graphic.

Lack of Integration

Although most faculty and administrators would acknowledge the benefit of design/build programs to their students and to their curriculum as a whole, it appears from the survey that the programs are not seen as indispensable or directly connected to the educational mission.

Only 5 of the 36 programs surveyed have a required design/build studio in their curriculum (refer Figure 2 above.) This fact is surprising considering "hands-on" design education is a pedagogical component of many schools of architecture. The rea-

sons for this lack of a mandate seem to fall into two possible categories: limited space within an already packed curriculum or skepticism with the perceived educational outcomes. Either way, the message is clear: design/build is not a necessary part of the education of an architect.

If design/build is not seen as a necessity, how then is it perceived by administrations and non-participating faculty: as an interesting diversion? a supplemental education elective? a community service? someone else's research project? good public relations for the university? Each of these perceptions begins to contribute to the marginalization of design/build programs.

Obviously, the context of design/build outside the traditional classroom inevitably leads to some isolation, but it cannot completely explain the marginalization.

Lack of Acceptance and Support

The survey found that many faculty expressed uncertainty about the perception of their colleagues towards their design/build program. In particular, five faculty used the word "mixed" to describe their colleague's opinions of the program.¹⁶

The criticism of design/build programs seems to focus on the lack of clear learning outcomes, the lack of disseminated scholarly research, and the drain on institutional resources. Within the academy design/build is constantly under attack as being less than rigorous and unscholarly. One faculty said that some colleagues "reduce (the program) to just swinging a hammer."¹⁷

Design-oriented faculty may feel that "the act of construction limits design complexity."¹⁸ One of the respondents said that, "sometimes the homes are criticized because they look normal and they are not experimental..."¹⁹ Also, several faculty commented that their colleagues feel that design/build utilizes too much of the department's precious resources in terms of faculty, time, and money.²⁰

The degree to which design/build activities veer away from academic definitions of research and scholarship frequently make it difficult for the academy to acknowledge collaborative work, an inherent part of design/build, in its promotion and

tenure procedures. In the survey faculty express some concern over the lack of institutional support even when these programs garner very positive attention for the university and often represent the best in community-outreach and service-learning.

There seems to be less confidence by design/build faculty that their peers respect and support them than the program in general. When asked what their peers think of them, a range of responses was generated: such as "I DON'T KNOW" to the "COLD SHOULDER" to "TOLERANT" to "SOME DON'T LIKE ME." Faculty engaged in design/build projects have expressed the feeling that the projects seem to alienate and isolate them from the rest of the school. In some cases faculty prefer this so they can proceed without interference, feeling that it is easier to be "outside the university." In some cases, design/build faculty are adjuncts or Professors of Practice and do not participate in their school's meetings and other faculty service and research responsibilities. From the responses it seems understood that they are somewhat on their own. The question is, then, "Is this "independent lone ranger role" a necessary structural component of the design/build program or can the program become more central in the architecture curriculum without forcing something else out?"

Finally, university administrations expect design/build programs to be self-sufficient and offer little or no financial support or release time for faculty from other duties. It is the general impression that administrations like to accept credit for the successes of design/build programs but prefer to stand in the background when it comes to liability and support issues. Design/build cannot be marginalized by either fellow faculty or administrations for it to succeed. As service-learning faculty Lund and Urey express:

*"Such an endeavor can succeed, however, only if the core faculty support it and it is regarded as central to the department's way of operating. In addition, since most of the activities (especially in a teaching-oriented university) will rely on service-learning, the faculty must agree that service-learning is an appropriate and broad interest in the pedagogies of community engagement....These contributions need to be seen as important by the rest of the faculty and must be explicitly acknowledged in faculty evaluation criteria, especially for untenured faculty."*²¹

FACULTY CHALLENGES



Figure 3. Author and student assess project budget for solar decathlon. Photo by Philip Gould.

Excessive Workloads

Just as excessive loads on the structure of a home may cause catastrophic failure, the same might happen to the design/build faculty. The multiple roles that faculty play in design/build programs, many of them unintended or prepared for, begin to suggest potential structural failure. These excessive loads also lead to lack of motivation among faculty and ultimately students. The burden of administering and planning can become the Achilles heel of design/build education. It is difficult for faculty members to shift between the managerial process of running a design/build program and simultaneously conducting research. For one reason, they are very different endeavors. Additionally, there is too little time between projects to properly reflect upon them. Although a cliché, it is especially true with design/build that distance is needed to be objective in evaluating the project. However, the next class of students demand the next design/build project before this distance can be achieved. Therefore, the proper reflection, research and dissemination often cannot be accomplished.

Multiple Roles

When asked what the role of faculty members in design/build programs is, there were many, varied answers. This fact is in itself disturbing because of the lack of clarity or consistency. The two most common answers were "advisor" (7 out of 41,) and "facilitator" (7 out of 41.) The next most common

roles were “critic” (5 out of 41,) and “mentor” (5 out of 41,) and “teacher” (5 out of 41). Three out of 41 responded “instructor”, “supervisor” and “leader”. Two out of 41 responded “director” and “manager.”²²

A few of the more unique responses were: “cheerleader” and “therapist.” And finally, with only one response, the role of “professor” was listed.²³ It appears that the required logistical roles of manager and supervisor, somehow overshadow even our most basic and important role of “professor.”

Also, issues of liability and responsibility often require a faculty member to take on the role of architect of record. This factor often forces design/build programs to become separate legal entities to shield the university from potential lawsuits. The multiple “hats” which design/build faculty often wears, coupled with excessive class sizes and large-scale construction projects contribute to expanding workloads for an already stretched faculty.

Expanding Student Numbers and Scope

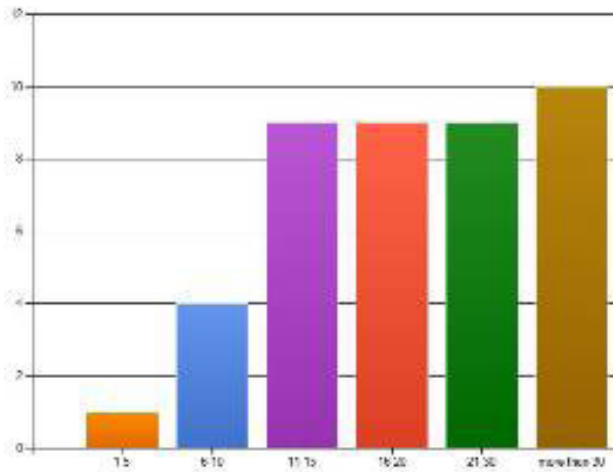


Figure 4. Chart- Average number of students in program. SurveyMonkey.com graphic.

In the experience of the author and in a prominent design/build book, 7-10 students per project are ideal in terms of effectiveness, learning, and safety.²⁴ However, the average number of participating design/build students per program per semester based on the survey is now 20.²⁵ How are these larger numbers being accommodated with the increasingly limited resources of most institutions? The author suggests that unless three or more full-

time faculty are engaged in design/build teaching, the programs are unsustainable.

Trying to accommodate the increasing numbers of students within the confines of a one-semester project seems like a recipe for disaster. Multiple faculty members would be required to sustain these programs. In addition, the scale of projects to be undertaken is affected. In the course of one semester only small installation projects can be accomplished unless students are enrolled only in design/build (as is the case with Studio 804, URBANbuild and the Rural Studio, for example.)²⁶ However, the data gathered suggests that larger projects seem to be becoming the norm. A majority of the programs (34%)²⁷ stated that their projects were valued at over \$100,000. In the author's experience, students prefer to tackle large-scale projects such as single-family homes. However, more research relative to scale and scope with regard to learning outcomes must be carried out. Ultimately, in order to clarify and better define these student learning outcomes, AND reduce the loads on faculty, the scope of projects should be carefully evaluated.

CONCLUSION

The challenges to design/build education are many and complex- from the overburdening and imposition of liability on faculty, to the lack of support from institutions and colleagues. Just as Samuel Mockbee compares design/build to war: it is not for the faint of heart.²⁸ And in fact design/build faculty have become proficient at “going to war” every year and successfully leading projects. Obviously, some faculty members have found strategies for defeating their challenges. But for many design/build programs, the days are numbered if conditions do not improve. They are not sustainable in the state in which they currently exist. Are we to stand by and watch the weak die in some sort of pitiful “law of the jungle?” Or can the weak programs be reinforced with the best practices of the strong programs as well as new innovative strategies?

The author proposes a few recommendations: first, design/build studios should be a required part of the curriculum of all architecture programs. Until faculty and administrations make this determination and the ACSA and NAAB promote and require this change, design/build will always be marginalized.

A hybrid/cyclical approach to design/build education is thus advocated for its long-term survivability and sustainability. Programs should be both independent and nimble, as well as dependent and integral to their parent architecture departments and schools. Design/build programs should be cyclical, preferably with a two years "on" and two years "off" cycle, or alternatively, have multiple faculty members, ensuring both that every student will have an opportunity to participate and that faculty will have time to recharge, reflect, and research. Barbara Jacoby stated in 1996 that *"Reflection and reciprocity are the key concepts of service-learning."*²⁹ This reflection is not only for faculty but also for students, because this is how they learn. Additionally, in each university, at least three faculty members should participate in design/build programs to engender partnerships, understanding, and trust. Not only is the workload too heavy for one individual, but it also isolates that person from other faculty members.

Given additional time to reflect and research, the design/build faculty can establish clear, defined, and limited learning objectives and outcomes for students participating in a design/build project. It is inadequate to simply say that students will receive "hands-on" experience. Clear objectives and stated project outcomes (For example, the exploration of a specific material or spatial concept) would provide a focus for the design/build program within the school's academic curriculum. In addition, the author recommends that a preparatory design studio be required prior to the design/build component in order to establish and reinforce the learning objectives.

Design/build cannot be seen as only service. Although there is great value in providing design and construction services for those who may not be able to afford it, the "learning aspect" of service-learning should be equally represented. As authors Moore and Wang espouse,

*"When service-learning is viewed solely through the lens of 'academic entrepreneurship,' the balanced reciprocity between service and learning is often compromised, resulting in less than desirable learning experiences for students, and often less than the desired commodity for the community client."*³⁰

Finally, based on recent experience (a topic for an upcoming article),³¹ the author recommends that design/build programs partner with community



Figure 5. UL Lafayette students at a collaborative Habitat for Humanity Project with their client. Photo by the author.

and/or industry organizations/companies in order to lighten the load on the faculty member and the institution. (For example, Habitat for Humanity provided the "heavy-lifting" of material procurement, subcontracting, and volunteer coordination in a recent project involving the author's design/build program.) Similarly, a general contractor can provide these tasks while at the same time potentially hiring some of the students as summer interns. After all, the practice of architecture requires interdisciplinary collaboration so there is no reason that the students should do all the construction tasks on a design/build project. Critics of this collaborative approach to design/build will respond that there is a loss of design and/or quality-control. While this may be true, this is, in the end, an opportunity for future architects to practice their construction administration skills and their humility.

The intent of this article is to foster an open and honest debate concerning the successes and shortcomings of design/build programs. A purely defensive posture on the part of design/build programs will not correct the structural deficiencies.

Only a house united will stand.

APPENDIX: FULL SURVEY

1. Name of program
 - Building Institute
 - The Miami University Design/Build Studio
 - Studio 804
 - Remote Studio
 - USF Design/Build

- *Free Lab*
 - *The Rural Studio*
 - *Design Build Topical Studio SoA UNC Charlotte (Faculty: John Nelson)*
 - *studiEAUX*
 - *Community Design Activism Center*
 - *Yestermorrow Design/Build School (many)*
 - *ecoMOD Project*
 - *2007 Univ of Illinois Solar Decathlon Team*
 - *Graduate Studies in Architecture + Health Program 1*
 - *University of Houston Graduate Design/Build Studio*
 - *Newschool of Architecture and Design*
 - *Urban Design Build Studio*
 - *Mississippi State University Program 2*
 - *UCD Design-Build*
 - *Urban Design Build Program 3*
 - *IITdesignbuild*
 - *Drury Design Build*
 - *Solar Decathlon Project Program 4*
 - *Design+Build*
 - *StudioTexasBuilds/AlleyLofts/SolarDecathlon Program 5*
 - *Solar Decathlon*
 - *Rice Building Workshop*
 - *URBANbuild Program 6*
 - *DesignBridge*
2. Who participates in the program?
- *Undergrads* 18.6%
 - *Grads* 11.6%
 - *Both* 69.8%
3. What year was the program founded?
- *Prior to 1990* 20.9%
 - *1991-1995* 16.3%
 - *1996-2000* 18.6%
 - *2001-2005* 23.3%
 - *2006-2011* 20.9%
4. On average how many students participate in the program per year?
- *1-5* 2.3%
 - *6-10* 9.3%
 - *11-15* 20.9%
 - *16-20* 20.9%
 - *21-30* 23.3%
 - *More than 30* 23.3%
5. How much time is allowed for a project's completion from start to finish?
- *1 semester* 41.9%
 - *2 semesters* 16.3%
 - *1 year* 20.9%
 - *More than 1 yr.* 20.9%
6. What is the average market-value of design/build programs per year?
- *\$500-5,000* 11.6%
 - *\$5,001-10,000* 9.3%
 - *\$10,001-20,000* 7.0%
 - *\$20,001-50,000* 14.0%
 - *\$50,001-100,000* 23.3%
 - *More than \$100,000* 34.9%
7. How are design decisions made for a project?
- *Student vote* 14.0%
 - *Faculty vote* 2.3%
 - *Both* 83.7%
- Other
- *consensus*
 - *The faculty is the tie-breaker*
 - *group discussions of design/time/budget/construction difficulty*
 - *faculty and student consensus*
 - *Actually, NO VOTE! Generally consensual process with a leader setting direction. Leader can be faculty or student.*
 - *consensus design process*
 - *collaborative or faculty design*
 - *It is not a vote, but a process of trying to reach a consensus. The faculty member ultimately has to make sure it is buildable within the time frame within the budget. The homeowner is the client.*
 - *Organic collaborative method, not a survival of the fittest model.*
 - *it is a collaborative process - no voting but decisions made by students*
 - *Actual answer is neither. Process involves collaborative decision making facilitated by faculty. No actual vote.*
 - *students work collaboratively and decide by consensus when possible and vote when not*
 - *students select best ideas and work on developing it*
 - *The projects are developed through a participatory design process. The residents in the communities that we work with have a strong hand in determining what programs are selected, and what form the designs ultimately take. Consultants and project steering committees also inform the process.*
 - *again, your questions suggest a centralized decision-making process ... we don't "vote," faculty just get an itch and students get on board ... but not sure if that's what you mean... my sense is students share in the decision-making for all of us, once a project is underway*
 - *the students work collaboratively to design the project; the faculty facilitate the conversation*
 - *combination of critique, owner and student*
 - *design develops as a group project and includes feedback from client throughout design process*
 - *Students are responsible for making most decisions with faculty veto power if necessary*
 - *faculty leadership*
 - *collaborative discussion and consensus-building among students, faculty and mentors. we try to avoid voting if possible.*
 - *By consensus*
 - *faculty and funding dependent*
 - *a discussion amongst participating students and faculty*
- 8.

9. How is the curriculum structured?

- Required studio 11.6%
- Topical studio 27.9%
- Elective 27.9%
- Special project 32.6%

10. What is the faculty's role in the design/build program?

- advisor
- mentor, teacher, leader, cheerleader
- Mentor, participant, teacher.
- Extensive
- facilitator of work: relations of client to students, budget, timeline, expertise offered relative to details, budget, execution.
- like a principal in an architecture office.
- Each faculty member teaching studio in summer may offer a free lab. Students also offer the labs.
- instructor, professional advisor and architect of record
- lead
- facilitator, guidance, etc.
- Leader. Critique. Instructor. Facilitator.
- realization -- all resources and initiative
- Design critic, project oversight
- It varies from project to project. When we were doing the 11 homes the faculty member was in charge of everything from money, building permits, sealing the drawings to working with the students & client on the design through all construction phases and certificate of occupancy.
- as mentor, critic, and facilitator. Our projects are art installations, so there are no actual 'clients'
- I oversee design, scheduling, budget, detailing, and construction.
- facilitators of the student's vision.
- I run the project - coordinate with non-profit partners before it starts, raise the money, and coordinate the students (all disciplines) and faculty. One engineering faculty member teaches the tech course, other faculty do regular advising -- weekly or bi-weekly -- on specific topics (thermal and daylight simulation; landscape, planning, historic preservation, business, environmental science, structures, etc.)
- Teachers/advisors
- Studio professor, advisor, critic, principal investigator
- Advisor
- As director, I set up project, manage the collaborative process, serve as architect of record, serve as final assurance of quality control, final authority on matters of code or life safety and final individual responsible for success in the field
- guide students for the developments of their work
- The faculty directs the studio and takes responsibility for the design through the permitting and construction process. The faculty also works closely with the community client in fund raising. The faculty is the common thread in the project from start to finish.
- Organization Design supervision Construction methods

- to conceive, typically (but not always) to find the client and site and probably the funds
- faculty: design supervisor, project manager and construction supervisor
- The faculty helps connect with the client and frame the methodological approach to the design build project.
- studio critic and logistics facilitator
- supervises process and building activity
- I am the only faculty doing Design/Build here. I find the projects, do the fund raising (except for one project) lead the course and I am on site at all times with the students.
- Mentor, oversight, financial responsibility
- leadership, coordination, fund raising, safety, design instigation
- Varies but generally planning and overall supervision. Faculty also do the work along side students.
- Design Instructor, Principal Investigator, Safety Officer
- To assist with design collaboration
- Shaping curriculum, building industry sponsorship, mentoring/teaching, decision-making, quality assurance/control, budgeting, procurement, liaison w/client and university decision makers, liaison with OSHA on campus, etc ad nauseum
- Critics, advisors, collaborators.
- director, Architect of record, Construction supervisor, therapist
- teacher, facilitator, project/construction manager, fundraiser, "principal-in-charge," licensed design professional, advocate, community liaison - faculty wear numerous hats.
- advisor

11. What is the setting of the design/build program?

- An office setting 7.1%
- A studio setting 92.9%

12. How much risk is taken in the decision-making by delegating to students?

- lots of risk
- alot of risk
- Our process of decision-making is collaborative among students, faculty, and our community-based clients.
- A great deal of risk but I have tremendous influence on all decisions.
- -depends on the type of "risk" you mean. Risk or failure of design? The design is the responsibility of the students, risk is low if you allow them to guide the design. Risk of not finishing? Empower the students and they will finish, Risk of going over budget? Faculty must manage this issue.
- Instructor oversees all decisions so risk is minimized.
- I don't understand the question.
- Plenty
- differs
- less than if it gets made top-down.
- Unknown.

- *all design decisions vetted by faculty and fellow students*
 - *Obviously a great deal of risk is involved, but the learning outcomes are much richer and the results more significant.*
 - *Again it depends on the design build project but if it is for a real/actual owner, risks are taken but ultimately they are tempered by the homeowner & faculty member.*
 - *all projects are built from found objects, with no tools. so there is a great amount of design risk, but no financial risk*
 - *The students do the design and detailing of the projects, but ultimately I decide what will be built (the final design) according to the budget and what can be constructed (detailing).*
 - *Students have to prove their ideas to peers and faculty. Risk is accepted collectively.*
 - *There is always risk - but that is part of the educational process. If I really have a major concern, I advise them to consider other strategies, but sometimes I'm willing to take more risk than they are. If the students don't feel like they 'own' the project, they won't be passionate about it.*
 - *The usual.....need to have backup plans when student(s) don't follow through or for other reasons are unable to make progress.*
 - *Some, especially with respect to means, methods and schedule*
 - *there are frequent meetings with sponsors*
 - *The main risk is not in the judgments but rather in the possibility that students will make errors. Faculty have to be final assurance of quality control.*
 - *well not as much because we guide them*
 - *60%*
 - *? One enters design/build understanding that there is risk at every turn and decision ... so sure, there's lots of risks involved in delegating to students, by definition. That said, motivated students tend to be engaged and make good decisions. Delegating? Doesn't seem to be in the spirit of a shared design/build endeavor.*
 - *A lot but it is important for them to feel apart of the project. Otherwise they feel like laborers.*
 - *A lot.*
 - *considerable*
 - *no risk*
 - *never risk safety. I always let them lead the design, but I stay very involved and guide them.*
 - *A reasonable risk, in my opinion. Rewards in student initiative and growth are worth it.*
 - *students are empowered to make decisions. however, faculty are constantly evaluating those decisions in terms of safety, schedule, cost, and the performative and aesthetic goals of the project*
 - *decisions are made jointly by faculty and participating students*
 - *too much*
 - *students are critical of their work and others work, so the design decisions are typically good ones.*
 - *If legal, code, or financial, relatively little risk is assigned to students.*
 - *We delegate, but watch very closely.*
 - *minimum once construction begins*
 - *Managed risk through significant oversight by both faculty and recent graduates on staff. Review and stamping as required by engineers and faculty architect - almost always significant quality control but at limited times, some more minor issues lack in-depth oversight. University perceives more risk than actual.*
 - *Given the types of projects, I do not think the risks are high. Students are responsible when they have ownership over a process and project*
13. If failure is not an option, should/can students take full ownership?
- *yes*
 - *yes and no- the faculty needs to know when a veto is in order*
 - *Failure is not an option because the work we do is for a community-based, non-profit housing development corporation. We work on its property. What we start we have to finish.*
 - *Not clear what you are asking*
 - *Failure can occur. But the students need to understand that the failure is their responsibility to correct. Especially if you are working for clients that need an "outcome"*
 - *No*
 - *Generally, the students don't own the projects, the clients do.*
 - *How can they?*
 - *in some circumstances*
 - *yes*
 - *Unknown.*
 - *not an issue*
 - *Failure is an option. If it is not, then students cannot be making decisions.*
 - *Failure is not an option in design build projects for a real client. The faculty who directed the studio will be getting the calls when the roof leaks or a door sticks. So the students can and should take ownership but they graduate and the faculty member guarantees the work.*
 - *the projects are art installations on site, so failure is an option. The making of the projects is as important as the objects themselves*
 - *The students take ownership, but I take responsibility for what is completed and accomplished. They don't have full ownership.*
 - *Absolutely.*
 - *This is exactly the issue at the heart of student decision making.*
 - *Failure for the SD not possible, but cannot have students take full ownership beyond their own personal sense of responsibility and the impact of the course grade.*
 - *No, as beginners not full ownership*
 - *yes or no*
 - *The students can take full ownership within their abilities and knowledge.*
 - *Yes*
 - *yes*
 - *Failure is not an option, so yes, there are constraints placed on what the students have*

power to determine. This is appropriate and models what happens in practice - moreover, they are still students with limited experience sets. Boundaries must be in place. If students take full ownership, then failure must be an option - the resources in my experience, do not enable that pure of a study. All of my students are required to take a parallel course that I teach where they are in complete control and can fail miserably without consequence to the client. I have found this to be an enormous help in developing skills and sensibilities.

- No. Our projects sometimes end in failure or go unbuilt as part of the education.
- ? Again, I don't understand the question. Failure is always an "option" or I might say a possibility. Everyone should understand that on the design/build project. Projects can go wrong. This level of "real" responsibility almost always is a motivating factor for the students, or at for the students who put more of themselves into the project.
- They can handle a lot of it.
- Students do take full ownership.
- no, faculty must have a hand in avoiding disaster
- yes
- The client and I give them comprehensive, thorough feedback all along the process therefore most of the failure happens in presentation. Their failures on site come in the details and are where they really learn, I let them fail where it is safe, then we tear out, redesign on site and correct. That is a great day of learning!
- yes
- students must take ownership of the project if it is to be successful-yes
- No
- Students should take ownership. They will use the project in their portfolio just like they would a studio project. They need to be able to present it, verbally and visually.
- Not in our university's point of view.
- An adult architect finally has to stamp the drawings. That is usually me, and my responsibility.
- they always tend to take ownership of some portion
- The team takes full ownership - students are more like intern members of the team at required times (ie riskier portions of work or decisions) Valued contributions by all and a clear communication of whole allows students a sense of ownership even though strong review by faculty/staff. Students are helped in process of decision-making though avoid top-down direction most of the time.

14. Has lack of student ownership ever been an issue? Please give a description of the structure and hierarchy of student leadership.

- Yes 27.9%
- No 74.4%

YES:

- Yes. There is usually a student leader/foreman.

- usually a student superintendent/manager leads the students
- Yes, but probably not in the way you're asking.
- yes. Students "own" their projects, but faculty retain veto authority.
- Ownership or an investment seems more a product of whether or not the project is private or community based.
- this is always one or two in the group that don't seem to participate as much and have a sense of ownership -- it is sometimes a little more true for the non-studio students -- who don't have the same time commitment, but often those students are just as committed
- sometimes students don't know all the details and decisions are made for them.
- There are those students who get into design build for the wrong reasons - to serve their own egos and build their portfolios. It is with these students that ownership becomes an issue. If it is not theirs, they have no interest in it. They are given one chance to correct their attitude or they are jettisoned from the team. I have a no tolerance policy on ego.
- Faculty did parti design and students completed fabrication and detail design
- particularly as the project transitions from one semester to another
- Yes in limited ways; ex) students in class resented support staff (recent graduates) for learning opportunities that appeared (and actually) to give them a fuller experience than the students (ie coordination of subs)

NO:

- Students always seem to be enthused with their projects. They develop ownership, which propels them.
- no. It is their design, they own it. They are responsible for completing the work.
- students are involved in all phases of projects.
- As I said, students don't own the work.
- all decisions collaborative or faculty
- Not often, but sometimes they are overwhelmed by the amount of work and the unexpected attention to detail that surfaces in a design build project. The question below is a bit strange. Are you friends with your students. I would say that we do spend long hours working side by side both in the design studio and the construction site so we get to know each other really well. Are they my friends, do I call them on the weekends and hang out? No. I enjoy spending time with them and working with them but I am still their faculty member, their teacher.
- The design decisions are the students up until the final design and construction detailing.
- We've been fortunate to have excellent students take on leadership roles.
- Collaborative process with multidisciplinary team allows ownership by all participants.
- Rarely. The students are given opportunity to be captain in at least one area of specialization or responsibility.
- students always developed the project with our feedback

- For those students interested in serving clients and the built environment as a whole, this is not a problem - essentially this is a individual, case by case issue.
 - Leaders come out of the student group, typically people with some building skills, or students with advanced design skills, or students who ask the best questions.
 - with students in charge of design, meeting with the clients and selecting the project it hasn't been too hard.
 - Students work passionately to complete each project.projects are always co-run with NGO or similar who takes ownership
 - collaboration means the individual is not relevant, it's all about the bigger goal, the same with ownership. everybody owns it, but honestly, this was never an issue.
 - I do NOT design and then give it to the students to build. We design together as a group. Students take the lead, I critique and guide.
 - students quickly took ownership and fully justified the decision to go that way
 - no, team leaders for various segments of the project - all students have the opportunity to lead at least one segment
 - Students work in teams and develop the project collaboratively from the beginning.
 - Several cycles of students have always been fully enlisted in a project, even if they did not start or finish it.
 - project leaders identify themselves early in the process and carry on throughout
15. Are you friends with your students?
- Yes 50%
 - No 50%
16. Do you participate in activities with students outside of the project?
- Yes 59.5%
 - No 40.5%
17. Do students always self-motivate, and what is done if morale fails?
- Yes 51.2%
 - No 48.8%
- If morale fails:
- I beat them mentally.
 - This has never been a problem.
 - pick themselves up and get on with it! Just like the real world!
 - reality(and group ownership) provides plenty of motivation
 - Unknown.
 - never has failed in 250 projects, probably due to short time period of three weeks
 - yes
 - These students are motivated. This is their first design project that is being constructed.
 - some do and some don't....
 - Yes to date. Only three project cycles.
 - we try to evaluate the project and the failures
 - Some students are motivated, some are not. I don't find design/build to be different than conventional studios in this regard.
 - some students do others need the group to pull them up. Other students withdraw
 - Yes. Cajole them back to the project.
 - wasn't a problem, in general
 - almost always, support and mentoring
 - yes, if morale fails you must go to a new class of students
 - This has never been a problem for us.
 - yes
 - Yes - largely - though some cheer-leading is necessary at times. Students are more self-motivated if they can control/direct a clear but small portion of the project and see how they need to work with the others and their areas.
18. Is it ever difficult to motivate yourself?
- Yes 40.5%
 - No 48.8%
19. What is the attitude of other faculty towards the program?
- mixed
 - usually respect, sometimes ambivalence, and on rare occasions, jealousy
 - Supportive
 - They put up with it.
 - depends on the faculty.
 - mixed
 - Do you mean other Faculties in the university? Teaching faculty in architecture who are not offering Free Labs? Our faculty have a great deal of autonomy in setting their curriculum, including design-build activities.
 - Excellent
 - indifference for the most part---young faculty are supportive
 - All faculty support the program. Not all faculty are involved in the program.
 - they all participate
 - Generally positive.
 - Generally, the program has very strong support from most of the faculty. The SoA believes that hands on experiences for our students is critical to their learning. Sometime the homes are criticized because they look normal and that they are not experimental, but failure is not an option. The goal is to use ordinary materials in creative and thoughtful & appropriate ways. The design and construction work for the 11 homes also needed to be completed within the same semester by the same group of students who designed the homes for the experience to truly be a design build experience.
 - the faculty are generally supportive, but communication with them regarding our unique program needs to be better.
 - Because the class is an elective, faculty see it as taking too much time away from their concurrent studio. I will be moving future design-build projects (construction) to the summer. The design portion will take place over the course of the academic year.
 - High approval.
 - My first design / build project started in 2000 (the 2002 Solar Decathlon) - and I had to fly

under the radar with some senior faculty. Now the faculty are comfortable with my project and they are quite supportive. I've had faculty of all four disciplines in my school participate - as well as several engineering and business faculty. The university promotes it a lot - although that does not necessarily lead to financial support.

- Some like it and some don't
- Good. There is a lot of interest in design build. Of course it helps to do rigorous and peer recognized work.
- mixed, but in engineering it is generally looked upon favorably.
- Varies from strong support for the program as a jewel in the College to frustration and impatience with the
- some are very supportive
- Mixed. I have very strong support from the Director/Head of the school and Dean of the College. There are two other faculty who find the program of value. The remainder have no interest in the school maintaining a Design Build Program. Adjuncts with professional practices see it as infringing on their territory and actively advocate against the program in multiple venues. The provost and president of the university are dead set against us having the program and have made it very difficult to pursue.
- Mixed. Some suggest it not to be architectural study while other feel it is fundamental to architectural study.
- There's at least a half dozen faculty who have or are working on design/build projects with students in the past six years. None of this is formalized, we just give moral support to each other, and understand and appreciate the difficulty of such endeavors. We do a good job supporting each other, and the entire faculty respects such efforts as well.
- I think they all feel like they could do it.
- They think that the work is admirable.
- supportive
- very positive
- Uninvolved and afraid that the program will take the "good" students away from signing up for their classes.
- generally very supportive
- varies greatly, some strong support and some resistance. some faculty do not see the value in design/build and think it is requiring too many resources in both time and money
- all the architecture faculty are in complete support
- Positive
- indifference
- This is a complex question. Resentment combined with support.
- We have always had great input from other faculty members. We try to keep them, as well as graduates, consultants, and contractors involved.
- concern, envy, fear
- Some appreciate the visibility and recognize

the enormous time commitment and extended schedule and semesters. Others are unhappy with the resources such projects require - shared burden by college/university - but nevertheless the burden on faculty to raise/manage additional funds is often overlooked. We do not have design/build in our curriculum and it is handled ad-hoc. The course substitutions required go through the academic standards committee - some are reluctant supporters, others enthusiastic. Some recognize the educational value, others reduce to 'swinging a hammer.'

- Respectful

20. What is the attitude of other faculty towards you?

- I think they respect me
- usually respect, sometimes the cold-shoulder
- Fine.
- Not sure.
- Depends on the faculty.
- not sure
- None of your business. These questions seem very loaded and pre-judging of potential responses. I find questions 14, 17, 19 and 20 particularly intrusive - so although I can't finish this questionnaire without answering them, my real answer would be MYOB.
- Excellent
- tolerant --many students come to school because of design/build & it's good for fundraising as well.
- Unknown.
- not applicable as all faculty participate
- Generally positive.
- The faculty are very supportive of my efforts, but most do not really understand the amount of time that it actually takes to orchestrate the event unless they have directed a design build initiative. It is not all fun times out on the construction site pouring concrete, laying concrete block or framing up a roof. It is very rewarding for both the students and faculty involved. It is not about good cop or bad cop but appropriate response to program, materials & site.
- supportive
- We all get along.
- Well-respected.
- That's always hard to say - but I've been tenured based upon this work, and they appear to be support of me and my students.
- Some like me (I think) and some don't
- Good, same as above.
- Generally have good working relationship and am respected by colleagues for doing a difficult job.
- some thinks it is wonderful
- I believe that it is predominantly positive - or that is the impression given. They believe that I am very hard on students, which I am. The students are being offered a tremendous opportunity and I expect them to take on as the privilege that it is to work for a client and contribute to the built environment. I think that the faculty understand and respect the point of

view.

- *Designers/Builders as academics suffer at the hands of PhD. faculty who believe their work to be more critical and scholarly. 5-7 years of practice and professional license are rarely ever seen as comparable to the completion of a PhD.*
- *I don't know, you'd have to ask them.*
- *I get a lot of support but I think the design is questioned behind my back.*
- *I am not sure.*
- *irrelevant to design build*
- *what is this about?*
- *The majority (not all) of them never mention Design/Build, never come to our openings, never acknowledge our awards or recognition*
- *generally very supportive*
- *respectful of the amount of work it takes to be successful in this endeavor*
- *good*
- *Positive*
- *Because my course is an elective course, I think there is less concern about the outcome, so the response is typically quite positive.*
- *This is a complex question. Resentment combined with support.*
- *great*
- *Largely positive and high level of respect for dedication required and shown.*
- *they support DesignBridge in principle but have little time to commit to it*

21. Is there a "good cop" and a "bad cop" in the program?
- Yes 23.8%
 - No 76.2%

ENDNOTES

1 Abraham Lincoln Online. Accessed July, 2011. <http://showcase.netins.net/web/creative/lincoln/speeches/house.htm>

2 There are currently 154 NAAB accredited professional programs in architecture housed in 123 institutions offering the Doctor of Architecture (1), Master of Architecture (95) or Bachelor of Architecture degree (58). In addition, six (6) institutions, are in the midst of establishing a professional degree program in architecture; these seven have been granted candidacy status.

http://www.naab.org/architecture_programs/

The exact number of design/build programs is unknown. This estimate is based on the author's anecdotal evidence.

3 SurveyMonkey.com. Survey conducted May, 2011.

4 SamuelMockbee.net. Accessed July, 2011. <http://www.samuelmockbee.net/about/quotes/if-you%E2%80%99re-going-to-do-this/>

5 Based in the author's anecdotal evidence. No conclusive number was available.

6 Stephen Kieran and James Timberlake, *refabricating Architecture* (New York: McGraw-Hill, 2004), p. xii.

7 ArchVoices.org. Accessed August, 2011. <http://www.archvoices.org/pg.cfm?nid=home&IssueID=1342&MaxResults=25&StartRow=51&searchwords=Search%20Issue%20Archives...&lineNbr=3>

8 Scott Wing. "Sore Shoulders, Bruised Ethics: The Unintended Lessons of Design-Build," in *From the Studio to the Streets*, ed. Mary C. Hardin, Richard Eribes, and Charles (Corky) Poster (Sterling, VA: Stylus Publishing, LLC., 2005), p. 91.

9 National Architectural Accrediting Board 2009 Conditions for Accreditation.

10 Survey Monkey online data from survey

11 There are 123 institutions. See Endnote 2.

12 Based in the author's anecdotal evidence. No conclusive number was available.

13 Author's calculations based on survey data.

14 Ibid.

15 National Architectural Accrediting Board data. Accessed August, 2011. http://www.naab.org/documents/home_origin.aspx?path=Public+Documents%5cNAAB+Presentations%5cFor+ACSA

16 See Appendix. Question 18.

17 Ibid.

18 Scott Wing. "Sore Shoulders, Bruised Ethics: The Unintended Lessons of Design-Build," in *From the Studio to the Streets*, ed. Mary C. Hardin, Richard Eribes, and Charles (Corky) Poster (Sterling, VA: Stylus Publishing, LLC., 2005), p. 91.

19 See Appendix. Question 18.

20 Ibid.

21 Hollie M. Lund and Gwen Urey. "Achieving Large-Scale Community Development Projects in a Teaching University," in *From the Studio to the Streets*, ed. Mary C. Hardin, Richard Eribes, and Charles (Corky) Poster (Sterling, VA: Stylus Publishing, LLC., 2005), p. 90.

22 See Appendix. Question 9.

23 Ibid.

24 William Carpenter, *Learning by Building: Design and Construction in Architectural Education* (New York: Wiley, 1997), p. 17.

25 Author's calculations based on survey.

26 Interview with Dan Rockhill (studio 804) and Byron Mouton (URBANbuild) May 2010

27 See Appendix. Question 6.

28 SamuelMockbee.net. Accessed July, 2011. <http://samuelmockbee.net/about/quotes/if-you%E2%80%99re-going-to-do-this/>

29 Keith Diaz Moore and David Wang. "Reflection and Reciprocity in Interdisciplinary Design Service-Learning," in *From the Studio to the Streets*, ed. Mary C. Hardin, Richard Eribes, and Charles (Corky) Poster (Sterling, VA: Stylus Publishing, LLC., 2005), p. 155.

30 Ibid, p. 162.

31 UL Lafayette's Building Institute Design/Build Program is currently working on two homes: one with Habitat for Humanity and one with a local contractor.