A Mission To Serve: Designing Homes, Training Stewards

KATIE WAKEFORD
North Carolina State University

GEORGIA BIZIOS
North Carolina State University

Critical design needs are going unmet in our country and around the world, perhaps none more confounding than the need for safe, energy-efficient, affordable housing. Habitat for Humanity reports 1.6 billion people live in substandard housing.[1] Recent data reveals that one in three American households spend more than thirty percent of income on housing.[2] Even for those of us who have access to adequate housing, diminishing non-renewable energy sources, adverse environmental effects, and rising energy bills signal the urgent need for improvement in the sustainability of our homes. Architects, as vital constituents of the housing industry, must turn their attentions to these already vast and growing crises. Abdication of these professional responsibilities is at least a missed opportunity and at worst an ethical failure. Infrequently addressed by the traditional design curriculum, students often require extra-curricular enrichment to become acquainted with the issues and strategies for the production of affordable, "green" housing. This paper will demonstrate the modest, yet we believe productive ways, we aim to prepare students to serve as stewards for our communities, delivering well-designed and constructed affordable housing.

OUR LAND GRANT MISSION AND THE HOME ENVIRONMENTS DESIGN INITIATIVE

In addition to its research and teaching missions, NC State University (NCSU), a land grant academic institution, has the mission to serve the citizens of North Carolina, extending services to the taxpayers of the state and applying new knowledge to the challenges of our communities. Each academic unit is called upon to participate in these efforts. One way in which the NCSU College of Design and the School of Architecture strive to fulfill their land grant mission is through the Home Environments Design Initiative (HEDI). HEDI seeks to initiate, facilitate, and coordinate scholarship, research, and outreach services in the area of quality design for home environments and provides a forum for the discussion of housing design issues among academics, professionals, and the public. HEDI partners with communities who are confronted with critical needs for affordable housing and who might not otherwise have access to design services.

In North Carolina, housing is fertile ground for such a university – community partnership. The need for affordable homes is enormous. The North Carolina Housing Finance Agency (NCHFA) reports there are 600,000 families struggling to find affordable housing statewide.[3] Due to a rapidly growing population, the recent influx of low-income Hispanic immigrants, and the aging baby-boomer demographic, the need for affordable housing is expected to grow. The NCHFA contends, "providing all of North Carolina's people an opportunity for decent, safe and affordable housing will require all the resourcefulness – and all the resources – that the state's housing industry and its local and state governments can deliver."[4]

LUMBEE HOME DESIGNS

In 2004, HEDI established a partnership with the Lumbee Tribe of North Carolina. The collaborative embarked on a multifaceted campaign to promote

quality home designs and an increase in home ownership among members of the Tribe. The role of HEDI was to assist in developing a set of Lumbee Home Design Guidelines, a set of Neighborhood Design Guidelines, and several prototype home designs to be used by members of the Tribe in building new homes for their families. For the student design team, Lumbee Home Designs offered opportunities to work in a unique cultural context while addressing the realities of a tight budget.

The Lumbee Tribe is the largest Native American tribe east of the Missisippi with 56,000 members. The majority of members live in four counties in southeastern North Carolina. Early contact with European settlers resulted in the Lumbee's historical and current assimilation on political, economic, and social levels, yet the Tribe prides itself on maintaining its cultural identity as a community of Native Americans. Lumbees have never lived on a reservation and although the Tribe maintains land holdings, the members live in small towns typical of southeastern North Carolina. Their rural heritage is an important aspect of the Lumbee identity and pride. As a result, most Lumbee families aspire to and strive for private homeownership in rural settings.

In September 2004, the NC State design team conducted a community workshop in Pembroke, NC, in order to get input from the clients. Approximately forty Tribe members and eight children attended the event. Nine architecture student facilitators coordinated the activities. Future homeowners discussed their needs and desires regarding issues of site, house, and construction materials. The information gathered, along with previous research done by the design team regarding Lumbee heritage, formed the basis for a series of guidelines focusing on sustainability, affordability, energy efficiency, and cultural issues.

Working under the supervision of experienced faculty, the student team prepared three designs: The Porch Home, The Patio Home, and The Courtyard Home. All three were very well-received by the Tribe's housing administrators and the future homeowners. Three of these Lumbee Home Designs are now built with more in the pipeline for development.

The fact that the designs were well-received is not surprising. The student team paid serious attention to issues and needs raised by the workshop participants and the housing administrators. The designs are simple in form and construction, but thoughtful in ideas for living. The designs provide spacious open family areas for gathering with extended relations and private bedroom zones. Porches, patios, courtyards, and backyard gardens offer places for outdoor living. Generous storage within small footprints reduces the potential for uncomfortably cluttered spaces. The prototype designs afford siting flexibility to adjust for solar orientation or street location and raised floor planes to protect from flooding common in southeastern North Carolina. Each home design allows for personal customization of interior and exterior elements. Several optional aspects can be easily added to the prototypes as budgets or family structures change. For instance, a "Bedroom Suite Option" can be attached to any of the designs to make room for a grandparent, a teenager, or a home office area.

The current efforts of the collaboration with the Lumbee Tribe aim to mitigate the dependence on trailers in their housing stock. Forty three percent of the Tribe's families live in mobile homes.[5] The outdated, poorly constructed, and inadequately insulated structures are extremely inefficient and fail to help owners build equity. Yet without other options, the Tribal Housing Authority regularly puts up to $20,000 into individual trailer rehabilitations. A much-needed alternative, "The Homesteader," is an inviting and light-filled 1,100 square foot residence and provides 3 bedrooms and 2 baths. Like the three initial prototypes, it is designed with flexibility for siting, plenty of windows, and welcoming porches. Two roof form options will allow the Tribe to build several together and avoid cookie-cutter monotony.

Early in the Homesteader planning process, the design team began investigating panelized construction, hoping that a prefabricated building system would bring the affordability needed and an expedited delivery system. The research suggested panelization could improve the quality of framing, decrease the framing time, protect against delays and material damage caused by weather, and minimize waste and associated costs. Structural insulated panel systems (SIPS) offer the

added advantage of an especially tight and well-insulated thermal envelope to reduce heating and cooling costs. The Tribe agreed to explore SIPS further. Even though the initial cost for one panelized house might be 10-15% higher than standard construction, the Tribe could achieve economies of scale by purchasing and building multiple units at one time. Considering the number of trailers the Tribe intends to replace, such volume will be a necessity. The anticipated benefit of lowered energy bills is a valuable asset the Tribe can pass along to its members. Hopefully, the reduction in monthly utility expenses will assist in minimizing mortgage defaults.

As the design moves towards construction, the Tribe has solicited bids from both conventional builders and manufacturers of prefabricated insulated panels. Unfortunately, after two rounds of bidding, the Lumbee administration has been unable to secure a low enough bid from a manufacturer to bring SIPS within budget.[6] The bottom line prevails over research, a disappointing reality check for the student team. The Tribe currently plans to build one Homesteader with standard construction, while they continue to search for a panel manufacturer to meet their needs. Despite the setback, we remain confident that panelization can be a useful tool in the delivery of affordable housing in general and of the homes we have designed. When they do find the right fit with a manufacturer, we will be able to make valuable comparisons of the cost and energy consumption of the two construction systems.

An important issue that surfaced early as a critical wish of the future homeowners, housing administrators, and the students was to strive for energy efficiency and sustainability. The Lumbee's Native American culture and heritage of respecting the land and its resources stands in stark contrast to the materials, design, methods, and systems typically used in the provision of affordable housing. This sad realization provided the climate for a commitment by all parties that the Lumbee Home Designs be well-constructed and energy efficient.

The design team consulted with Advanced Energy, a non-profit corporation located in Raleigh, North Carolina, to assure the homes' energy demands are minimized. Advanced Energy's innovative *SystemVision* program emphasizes tight construction, proper installation of insulation, and careful sizing of mechanical systems. Homes constructed to the *SystemVision* standards are eligible for a heating and cooling cost guarantee for two years.[7] Students and Lumbee housing administrators have participated in training sessions that prepare them to be energy advocates for the future homeowners. Achieving the *SystemVision* certification is one of many incremental processes in our work. While the construction schedule of the first Lumbee Home Designs built by the Tribe was not accommodating to *SystemVision's* appropriately demanding specifications, we are hopeful that the Homesteader timetable will allow for the requisite inspections.

What makes the Lumbee Home Designs project distinctive, although also replicable, is the fact that it gives students the opportunity to design in response to particular cultural needs, with defined construction costs and budgets, while applying high standards of sustainability and energy efficiency. In other words, it is a challenging professional experience. Beyond the education in affordable housing and "green" design, participating students make a commitment to community engagement, discovering the value of local expertise, honing the interpersonal skills that build trust over time, and learning that nothing gets done without collaboration and some compromise.

ARCHITECTURE'S COMMUNITY DESIGN HERITAGE

The discipline of architecture in the United States has a history of community design as public service. The political and environmental activism of the sixties found fertile ground in architecture. Several schools, such as NC State University, established outreach programs in order to provide design assistance to groups of citizens and neighborhoods that individually or collectively would not otherwise have had access to architectural services. The projects most often involved master planning, the design of alternative solutions in areas of Urban Renewal, and adaptive reuse of existing buildings. The profession, through the AIA, established the Urban Design Assistance Team (UDAT) and the Rural Design Assistance Team (RUDAT). These programs organized professional teams to work on site in a "charrette" mode over a period

of three to four days developing design proposals for community groups with a town, neighborhood, or street revitalization focus.

A recent essay by Anthony Shuman provides a thorough history of service learning in architectural curricula during the last half century. He contends that by the 1980s, architecture began to renege on its commitments to social engagement and retreated into the formal debates of postmodernism and deconstruction, and the explorations of digitally generated design. He explains, "The successive design trends of the past 30 years, although enriching the design palette in formal terms, have reinforced a narrow spectrum of architecture practice focused on the elite designer and the signature building."[8] With the tide once again beginning to shift, Shuman encourages reinvestment in a broader understanding of the architectural disciple which will require students to be trained in skills for community engagement.

Similarly, in "Building Community," a study of architectural education and the profession, Mitgang and Boyer devote a chapter to the issue of "Service to the Nation."[9] They conclude that there is community need and interest calling for architecture's involvement and expertise. Although universities and students are eager to participate in community service learning efforts, architectural education frequently lacks a "climate" for service.

The discipline of architecture also has a long tradition in "making," a legacy that dovetails easily with public service. In recent years, this tradition has manifested itself in the proliferation and popularity of Design/Build programs. The emphasis of these projects is to involve students in the "making," in constructing a structure they have designed. Often there is a service component to these efforts since the built structure is most frequently for community use, sponsored by a nonprofit, or involves the community of users in the design process. Also, popular among students and faculty are local Design/Build competitions/projects such as homes for Habitat for Humanity.

Reflecting upon the existing literature and our anecdotal experience, we agree that service learning in architecture curricula is sporadic, and not systemic. The magnitude of the community needs in combination with the value of the potential learning experiences implore the expansion of university engagement activities. Programs may look different than the precedents of the previous decades. In reponse to changing community context and needs, service learning programs must constantly assess and adjust. Architecture curricula and the profession need to strive for a climate of public advocacy, a culture of service, with a diversity of tools and strategies. We must encourage different modes of life long learning and service values in order to train stewards.

CRITIQUE

There are many difficulties and some just criticisms of projects such as ours that involve architecture students in providing design services. The Lumbee Home Design project has not been without frustrations. A critique of the project points to the same issues as most efforts that involve architecture students in "real world" project settings.

1. The academic setting and semester calendar do not easily accommodate community projects. The workload demands and inconsistent flow of service projects do not match the typical rhythm of the academic schedule. For example, client meetings and deadlines may fall during exams, on studio project deadlines, or during vacations.

2. Students can experience high stress levels when trying to balance their academic responsibilities with a service project. Project locations often require travel, sometimes several hours in each direction and/or overnight stays. This necessitates excused absences from other classes and for some students the shifting of family responsibilities or job commitments. Community design projects require teamwork, similar to an architectural practice. Since most course work in the current architectural curricula is individual, often the students do not have any significant experience in teamwork. The demands of service projects may exaggerate the challenges of working as a team and as a result conflicts can arise.

3. For faculty, outreach projects require significant time commitment and emotional involvement, more so than any other course, including studio courses. The students involved are constantly challenged as designers, as community organizers, and as team members. They require the

timely support of an experienced faculty member. Necessarily, this teaching is indeed tutorial in nature and can involve only a few students at a time. Despite the close interactions or because of them, it is sometimes difficult to grade the work produced and the knowledge gained. Service teaching in architecture often results in a high faculty "burn out" rate.

4. The impact of these projects can be questioned by those involved and those who evaluate the results at the end of an academic semester. Similar to practice, design is only one aspect of the work performed. Appraisals must include the value of other acquired skills. Additionally, projects move slowly and the change they bring is often small. For example, the Lumbee Home Design project producing three modest homes built in three years is considered a great success. It takes patience, perseverance and good will from both sides of the partnership (academy and community) to keep projects moving and relationships strong.

THE IMPORTANCE OF TRAINING STEWARDS

Why then should architectural curricula provide community design service learning opportunities to their students? There are a number of good reasons for university community partnerships that architectural education cannot afford to miss:

1. Public service oriented work is rewarding. For students and faculty who have the affinity and patience, the sense of affecting positive change is gratifying. Even at the most modest pace of one house at a time, one student at a time, the results count.[10]

2. Pedagogically, service learning is growing in importance in higher education. Universities are encouraging faculty to connect the classroom with the community context. Faculty are recognizing the significant level of enrichment such activities can bring to the curriculum and to the content of coursework. Real world application of theoretical concepts deepens understanding.

Architectural design by its nature of addressing client needs and requiring special skills such as three dimensional thinking, problem solving, application of technical knowledge, and drawing, is an ideal discipline to link young practitioners with community needs. Architectural curricula that take leadership roles in community engagement can become significant players in efforts by universities to achieve the extension aspects of their mission. This is particularly true in research extensive higher education institutions in the land grant tradition, such as NC State University.

3. Student creativity and enthusiasm is a valuable resource to harness. Architecture students are actively seeking opportunities to commit their developing skills to public service through outreach activities. Boyer and Mitgang found that nearly a quarter of architecture students named "improving the quality of life in their communities" as their number one reason for entering the profession.[11]

4. Communities learn and change from their engagement with students, faculty, and the resources of the university. Before one structure is framed, the client community is exposed to the design process, learning what architects do and how architecture can positively influence their lives. Students become teachers, sharing their newly acquired knowledge. When the first Lumbee Home Design was built with vinyl siding (in spite of our recommendation for using other siding materials), the student team committed itself to a campaign of research and education, convincing the Tribe to make a more environmentally responsible choice of cementitious siding for future construction. Our profession, typically perceived as catering to an elite few, demonstrated its capacity to care for and contribute to many.

We made special efforts to involve Lumbee children in our outreach. The community workshops included special activities for children in an effort to involve them in the process and possibly attract a new generation to the architecture profession, especially from a socioeconomic group that might have little prior awareness/interest design. Plans are underway for a Lumbee Home Designs Career Exploration camp for middle-schoolers.

5. The relationship forged between academic institution and partnering organizations yield reciprocal benefits. The engagement, fostered by the goal of community service, drives research agendas while the productivity of faculty and students catalyze into economic development, healthier citizens, a stronger state. Dissemination

of scholarly pursuits contributes to the public discourse.

6. Arguably the most significant benefit of involving architecture students in community design projects is the fact that such opportunities instill values of public service and direct young professionals into such careers. We know that architectural internships often influence the direction a student will take in professional life. If only a few members of the HEDI student team embark on a career path dedicated in some part to the affordable housing needs of our state, it will be a significant benefit. If the others take their experience back to school, to their firms, and to their communities, the ripples will be expansive. No matter what career path they choose, community design projects often give students positive, life changing experiences.

CONTINUING ARCHITECTURE'S COMMUNITY DESIGN HERITAGE BEYOND THE CURRICULUM

We are now imagining how our efforts might develop and expand. One opportunity might be found in the Intern Development Program (IDP). This required three year internship that provides the transition from school to the profession continues to be much discussed and criticized.

Casius Pealer, in a recent article titled "Nonproject work experience: beneficial to all, but far too rare," argues that "the architectural profession does not support these [public and nonprofit practices] unique training settings as thoroughly as professions such as law and medicine do".[12] He estimates less than ten positions annually for approximately 4,000 professional degree graduates. In his assessment, the experience that these interns gain in being entrepreneurial, working closely with clients, and producing quality design work make them very valuable and sought after employees to traditional architectural practices.

In 2005, Marvin Malecha, FAIA, published a monograph proposing a bridge between the academy and professional practice.[13] He suggests that some schools could become integrated into the profession by taking on additional roles and developing internship experiences. On the other hand, some offices might organize themselves as "practice academies," as learning organizations transforming both the internship culture as well as the practice environment. Public service projects would be ideal for these types of reorganizations.

The Lumbee Home Designs project has given us the opportunity to test the "practice academy" model by providing two recent architecture graduates with nonprofit work experience for a total of two and a half years. We have found that the ability of interns to apply their acquired skills and to work at least 30 hours a week, along with their enthusiasm for community service, has contributed significantly to the success of our projects. It has also provided two interns with a supportive and rewarding transition from academia to careers in architecture.

CONCLUSION

There is more than one way to train citizen architects. Curricula need to provide multiple vehicles for learning about public service and environmentally responsible design. Ours is one small successful effort, one option in many. The built products of Lumbee Home Designs are a demonstrable form of stewardship. Homes as artifacts of an architecture school's commitment to public service. Homes as models for sustainable design and construction methods. Yet the more far-reaching act is that of training young designers to be good stewards, for their communities and our environment. Incoming classes of undergraduate and graduate architecture students, as well as graduate interns, are longing for such opportunities. Schools must answer these calls with a commitment to educating future architects about how to serve a greater range of clients and how to build a more sustainable world. NC State's Home Environments Design Initiative is just one such endeavor and Lumbee Home Designs is one of its significant, successful, and continuing projects.

ENDNOTES

1. Habitat for Humanity, "Why Habitat is Needed." http://www.habitat.org/how/why.aspx.

2. Alexander, Barbara, et al. State of the Nations Housing 2005. Cambridge: Joint Center for Housing Studies of Harvard University, 2005. p 3. http://www.jchs.harvard.edu/publications/markets/son2005/son2005_bw.pdf/

3. Jones, Lucius and A. Robert Kucab. The State of

Housing in North Carolina. Raleigh: North Carolina Housing Finance Agency, 2006. p 1. http://www.nchfa.com/Nonprofits/RRstatehousing.aspx/

4. Jones, Lucius and A. Robert Kucab. The State of Housing in North Carolina. Raleigh: North Carolina Housing Finance Agency, 2006. p 3. http://www.nchfa.com/Nonprofits/RRstatehousing.aspx/

5. Quillin, Martha. "Lumbee Tackle Housing Woes." News & Observer, January 7, 2007.

6. The bids received were about 15% higher than conventional stick built construction. This was based upon one house since the Tribe's Housing Administration was not in a position to contract for many houses at this time.

7. Advanced Energy, SystemVision. http://www.advancedenergy.org/buildings/knowledge_library/systems_approach/systemvision/index.html

8. Shuman, Anthony. "Introduction: The Pedagogy of Engagement," in From the Studio to the Streets: Service Learning in Planning and Architecture, ed. Mary C. Hardin and William Zeisel. Washington DC: American Associaion for Higher Education, 2005. p 8.

9. Boyer,Ernest L. and Lee D. Mitgang. Building Community: A New Future for Architecture Education and Practice: A Special Report. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching, 1996.

10. In three years, sixteen students have participated in HEDI projects. Thirteen have worked as paid research assistants and three have received independent study credit for their efforts. Additionally, HEDI has employed two recent graduates as interns after completing their degrees.

11. Boyer,Ernest L. and Lee D. Mitgang. Building Community: A New Future for Architecture Education and Practice: A Special Report. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching, 1996. p 9.

12. Pealer, Casius. "Nonprofit work experience: beneficial for all, but far too rare." Architectural Record (August 2007), 63-64.

13. Malecha, Marvin. The Learning Organization and the Evolution of the Practice Academy Concepts. Raleigh, NC State University College of Design Publication, 2005.