

ECOLOGY *and* DESIGN

**Ecological
Literacy in
Architecture
Education**

2006 Report
and Proposal



The AIA Committee on the Environment



says he is “not sure if that will prove or disprove that the conventional wisdom from current literature is accurate. I suspect we will find some flaws in our thinking. Some of our strategies [may] not actually reduce environmental impact when we thought they would. If this happens, it is a unique teaching moment—and an opportunity to refocus the design process for the second and third prototype.” The 2006–2007 and 2007–2008 academic years will build on this research to inform the design of a second and third prototypical home.

The first ecoMOD year began in fall 2004; the first prototype was completed in summer 2005. Student reactions to the program suggest that the course structure created a successful collaborative environment. A collaborative design process where students work in groups can be difficult to achieve successfully but is a critical element to the sustainable design process. One student remarked that “this project has given me the opportunity to learn how to work with others. I believe this is one of the most important skills in our field but we don’t often have a chance to practice it in school.” Another student comments that “this process is much more rigorous than a typical studio because you are constantly forced to question and defend design intentions, a process in which the stronger design intentions will remain and yield a more refined project.” Students leave the course with a more realistic understanding of the complexity of issues surrounding both sustainable design and the design of affordable housing. One student observed that the course exposed her to the challenge of “trying to balance the issues of economy and ecology” and has realized why “people don’t always build the way I think they should.” The greatest outcomes of the class for the student will likely come in future years through the evaluation of their work. “The best possible design comes from a cyclic, reiterative effort,” one student observes, “a process that I have come to firmly believe.”

In addition to exposing students to a collaborative, reiterative, design process, perhaps the most significant outcome of the course will be its contributions outside the school of architecture. The development and evaluation of an environmentally sensitive, affordable home can transform the housing industry by sharing the lessons from the ecoMOD program. According to Mark Watson, director of project development for the Piedmont Housing Alliance, “Piedmont Housing Alliance has learned that it is possible to create a very energy-efficient, uncommonly sustainable home, at an affordable price in a very short time. The UVA student’s tireless commitment to the project’s timely completion and dedication to excellence in the home’s construction has inspired the PHA to consider how to bring the project concept to the next level...large-scale production. With what appears to be another global energy crisis on the horizon, the ecoMOD house may be the prototype for future American housing. Energy-efficient, sustainable, healthy and flexible, the ecoMOD house may become what our grandchildren call home.”

Clemson University, School of Architecture

Animated Architecture: Master of Architecture Thesis Research and Design Studio

Submitted by Keith Evan Green

Now in its third year, the Animated Architecture Studio is a two-semester thesis option in Clemson’s master of architecture professional degree program. Organized by associate professor Keith Evan Green, the course illustrates how biomimicry principles can lead to compelling results in a design studio.

Inspired in part by David Orr’s concept of ecological literacy, Green asks students not to design a single building or a project focused strictly on environmental performance. Instead, he proposes what he calls a “sustainable socioecological community: a dynamic and productive network of people, nature and artifice.” Biomimicry, an increasingly popular idea in sustainable design, proposes that cultural artifacts should emulate the process of natural systems. Green compares

architecture to living beings that “grow, adapt, metabolize, evolve, breathe, mutate, camouflage, and reproduce.” For instance, one student studied the resilience of slime mold and designed a mobile kiosk with similar traits.

The approach conceives of buildings as part of a specific ecosystem from which the features of the architecture directly evolve. With that in mind, Green emphasizes the importance of understanding a place comprehensively before designing for it. Accordingly, studio projects always focus on the region around Clemson, specifically the Interstate 85 corridor between Atlanta and Charlotte. This way, students can interact more substantively with the design context than they could with a remote site. Typically the focus is on problems with current development in the region. Students collaborate in teams to identify particular trends or areas that are of concern and propose critical strategies to correct the problems. One project, for instance, included a housing scheme that made use of land that conventional developers deemed unsuitable. Another began with the idea of improving the hydrological impact of typical suburban subdivisions. And another team found that a rapidly growing community along Interstate 85 suffered from piecemeal development, so they designed nine sites to be linked as a continuous, codependent network.

While the studio resides in the architecture school, it strives to bring an interdisciplinary perspective to the process by engaging faculty members from other departments. Students select a thesis committee of four to six people from various fields and meet with them six times over the course of the year. The thought is to evaluate student work from multiple perspectives, including political, social, cultural, and economic. The process attempts to circumvent curricular distinctions between studio, theory, history, technology, and professional practice courses by integrating deep research and practical solutions within the context of a design studio.

Green sees the course as an alternative not just to conventional approaches to teaching a studio but also to conventional understandings of sustainable design, which he says is conceived too narrowly and practiced as if it is a “club” for exclusive members. “What’s remarkable about discussions of ‘sustainability’ in architecture,” he says, “is that they almost always fail to mention the sustainability of people, the wider system of living things, and how all coexist and thrive. Sustainability is not just about nontoxic and recyclable materials and thermal control; it’s about improving and expanding the well-being of living things across the built and natural environments.”

To that end, Green has students focus on what he calls “urban-rural interface,” where he thinks development has been least inspired. For example, one student project seeks to reconsider the economic and ecological potential of farming by combining agricultural and cultural activities in a “rurban” hybrid development. Green says these neglected areas should be a central topic for architects practicing in North America, and he sees his studio as training students to tackle these issues after graduation. “For me, academic courses in architecture should consider pressing issues for the built environment and forge directions and responses that might guide architectural practice. Architectural practitioners, meanwhile, might listen some to what the schools reflect on what being an architect means today, and work to avoid becoming irrelevant.”

The Animated Architecture Studio is just one arm of the Animated Architecture Lab, a research/teaching unit Green organized with architects, planners, environmental scientists, biologists, and social scientists. The group studies how architecture can best grapple with issues such as accessibility, consumption, flexibility, and production—issues Green says are often neglected by designers, clients, and communities. His activity at Clemson “didn’t set out to satisfy

a narrow definition of ‘architectural sustainability’; it took on a larger crisis in the way we inhabit the environment.”

To address this crisis more effectively, the Animated Architecture Studio would benefit from working closely not just with non-architecture faculty but also with students from other departments and with the larger community outside the university to ensure that a diversity of views informs the act of design and not just its review. However, the course is still very new and inevitably will evolve over time. As Green says, “We architects must tackle these difficult, complex problems with all our resources and welcome collaborators to help us where we lack the expertise. Sustainability demands this kind of interdisciplinary conversation.”

For now, the studio represents some of the most compelling design work submitted to the Ecological Literacy in Architecture Education program, demonstrating that design excellence measured by any standard need not be sacrificed to address ecology. In academia as well as professional practice, some of the best designers have ignored sustainable design, possibly because they see it more as an ethical or technical agenda than as an aesthetic one. The work of these Clemson students shows the potential for sustainable design to create exciting forms.

SPECIAL RECOGNITION

Ball State University, College of Architecture and Planning and the Center for Energy Research/Education/Service

Arch 501 Graduate Design Studio and the Greening of the Campus Program

Submitted by Robert J. Koester

Professor Robert J. Koester, who is also director of Ball State University’s (BSU) Center for Energy Research/Education/Service (CERES), has taught this graduate design studio for five years. The studio course examines the relationship between (environmental) context and design, addressing local resource availability and cultural context, culminating in the design of a Center for Regenerative Studies.

The front end assignments get at the allusions to natural process in terms of evolution and development. If there’s a mantra in Koester’s studio, it is that there is no right answer. “I think that this message is liberating for students,” he says. “They have to realize that they are in control of the discovery process, and see it in those terms. They get a higher reward for making many transformations rather than shaping a single form.” Even the best students are plagued by deeply embedded conventions and habits and struggle with urges toward iconography.

Students use ink and paper, physical models, and computer programs, including Energy-10, Rhino, Form-Z, and 3DMax. Koester pushes the students to discover distinctions between conventional design delivery process and a new model, one that benefits from stepping back and querying. “It’s a breathing-in-breathing-out model—collapse and expansion,” Koester says. “I try to show them how spending more time in schematic design would significantly shorten the time required if they were they to reach the construction documents phase because so much is already embedded in the design.” This is an important connection to practice.

The site and “client” for the Center for Regenerative Studies changes for each studio; some offerings have provided chances for engagement with the profession. The year the studio had a Cincinnati site, AIA Cincinnati COTE was involved and members juried the student work. In spring 2005, the Ecosa Institute, in Prescott, Ariz., served as the client. Antony Brown, director,