

Fruitful Relations

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Abstract

The Innovation Studio Program (Innovation Studio) at the Rhode Island School of Design (RISD) is a joint effort of the Departments of Landscape Architecture and Industrial Design to create an opportunity for students throughout the college to work together on large-scale environmental and infrastructural problems - such as the design of landfills, power plants and manufacturing facilities. Through these design studios, the Innovation Studio has begun to develop a new paradigm for environmental design; to test pedagogical methods for interdisciplinary, collaborative, project-based work; and to build bridges between academia and the professions.

Introduction

Can the wasted lands of a dump be made fertile? May there be fruitful relations between a factory and a river? At the Rhode Island School of Design students are exploring how to shape natural systems and industrial ecologies to care for one another in an ongoing experiment known as the Innovation Studio Program. The Program draws students from Industrial Design, Architecture and Landscape Architecture to work on large-scale infrastructure projects. Working together, the students are developing a new model for infrastructure - one that imagines that plants are technologies and that buildings are breathing organisms.

To test these ideas requires a wealth of technical knowledge. As the Program has evolved we have come to rely on broad teams of experts, legislators, business people, designers and community activists to assist the students to develop design proposals that are both imaginative and pragmatic. Even in an open-ended academic environment harnessing such diverse expertise can be a challenge. To facilitate more effective teamwork, the Innovation Studio has been developing collaborative methods since its inception in 1999.¹

Over the years, student projects have included proposals for an eco-industrial park, a landfill mining operation and a power plant.² Regardless of the particular topic, each semester shares three common concerns: the development of innovations in program, pedagogy and practice.

The Studio as a Model of Comprehensive Design

The Innovation Studio is concerned with exploring healthy, symbiotic relationships between industrial ecologies and natural systems. Current environmental and infrastructural problems require balancing technical solutions with community concerns; satisfying environmental regulations and meeting limited budgets. Yet, most professional projects do not address community and environmental issues in their initial designs. Through the student's design work, the Innovation Studio aims to illustrate the benefits of integrating these concerns into comprehensive project proposals. We believe that such benefits are both environmental and economic, and may include: speeding bureaucratic approvals, savings in operational costs, sustaining local ecosystems, and helping to assure the long-term health of our cities.

The course offered in the spring of 2001 illustrates this approach. In the "landfill studio," students were charged with transforming a municipal landfill into a public space for the city of Phoenix. Underlying this assignment was the observation that new regulations have made landfills less noxious and dangerous places. These new standards yield opportunities to integrate programs that can reintroduce this important infrastructure to the public, for example: community and educational facilities to educate

the public about waste management, or new parks that use the generous open spaces once used to isolate the landfill.

To fulfill their assignment, the students were directed to develop designs that integrated the landfill's obdurate and dirty programs with recreational and educational programs on the adjacent river. In the first weeks of research, however, the students discovered that the landfill was not lined. Alarmed at the prospect of toxic leachate contaminating the city's aquifer or leaking into the Rio Salado, the students made protecting the City's water supply their first priority. ³ This decision led them to develop a clean up plan for the landfill. The initial program assignment, in this case recreational and public program, is often modestly framed in order to allow the students to develop and define the "studio problem." Their critical engagement can lead the studio in unexpected directions.

In the landfill studio, the student's initiative led to a completely new solution, which they articulated in a three-part Master Plan to clean up the landfill. The first component of the Master Plan was the consolidation of the existing fill. The students' plan called for reducing the overall contents of the landfill by extracting the daily cover (accounting for approximately 25% of the landfill's total volume) and valuable recyclables (nearly 6 million dollars in aluminum cans) before transferring the remainder into newly constructed chambers engineered to speed the degradation cycle through the controlled introduction and regulation of fluids.⁴

As reopening the landfill required it to meet current health and safety standards, the students sought to keep the "new" facility open. While the newly constructed chambers would degrade garbage more quickly they would not keep pace with Phoenix's waste production. In order to delay developing new landfills, the master plan proposed a comprehensive recycling and remanufacturing program for the city. This program would reduce the amount of garbage intended for the landfill by distributing yard waste to commercial composting facilities, moving usable materials to onsite re-manufacturing facilities, sending recyclables through an existing trash transfer station and depositing organic waste into the landfill.

The second part of the Master Plan was a bio-remediation system to treat the wastewater produced in (and after) the consolidation process. The system cleaned leachate and returned it to the specially engineered landfill chambers to speed decomposition. At the same time, the settling tanks and aeration pools of the system were designed to serve as emergency overflow dams, that would contain and treat excess leachate, eventually releasing near potable water at the river's edge.

The final component of the Master Plan was the original community program, now directed to support the new design. A community self-haul program was proposed to increase voluntary recycling and bring people to the facility. A citywide advertising campaign was developed to illustrate the positive products of the new commercial programs which included electricity, compost and native plants. Physical recreation and nighttime festivities were sited to take advantage of the facility's open space and transform its grounds into a public amenity for the larger community.

Through the integration of these wide-ranging elements, the landfill studio's Master Plan suggested that a more comprehensive design could better serve the community in which it was sited, help avert a municipal calamity, educate a city, and slow the need for development of new landfills in the metropolitan region.

The Studio as a Pedagogical Model

The Innovation Studio's pedagogical objective is to develop and demonstrate successful models of interdisciplinary work. The complexity of the technical systems we explore requires the input of a diverse team of professionals. Because the students are responsible for defining the problem, the studio frequently requires a broader range of experts than I can anticipate at the beginning of the semester.

Over the years the Innovation Studio has consulted with engineers, designers and industry representatives; drawn on community activists, anthropologists and environmental artists; and worked with policy, planning and design students from other schools. Accessing and integrating these participants has furthered the Program's collaborative experiments.

Developing sound methods of collaborative work is important because most design studios continue to emphasize individual effort. Students entering the Innovation Studio have internalized this bias, bringing with them a general resistance to group work. This discomfort is often exacerbated as landscape architects, architects and industrial designers work together for the first time. To help break down disciplinary differences and acclimate students to the idea of working together each semester begins with a research phase. In this phase, each student is responsible for mastering three topics that the entire group will need later in the semester. Every student thus becomes a valuable resource, regardless of prior training or personal talent. During this period, the students share their findings in group discussions that help build a common vocabulary.

Once the research phase is concluded students move into a collaborative design effort. Before developing concrete proposals, they must build consensus around broad issues. At the beginning of this phase, community activists, experts, artists and students from other schools help brainstorm different strategies for the design. Small groups each address one aspect of the project, one group might ask what the landfill "wants," while another considers the interests of the city or the river. This separation of issues (and stakeholders) identifies a broad spectrum of approaches.

Following the brainstorming session the RISD students develop a set of design guidelines derived from those competing (and often divergent) ideas. Those guidelines frame their efforts to devise a single Master Plan for the project. At each step in the process, the studio as a whole must agree on what they are going to do next. This level of student control is very unusual in a design studio and contributes to the student's identification with the group and heightened personal investment in the studio's outcomes.

In the final phase of the studio, students work independently. While it is not uncommon for a design studio to culminate in personal projects, the Innovation Studio Program marshals individual work to illustrate and critique the results of the group work. Throughout this phase students continue to work together formally and informally. Progress on each student's project is guided and critiqued by peer review teams. These teams include the person who researched the topic in the first phase, members of the charrette team that focused on that aspect of the project in the second phase, and students whose individual proposals are on adjoining parcels. Through these peer reviews expertise is shared and common goals are reinforced even as design directions are allowed to diverge. By this point in the semester students are so accustomed to working together that they frequently site their projects on and in each other's proposals.

The pedagogical methods that are embedded in the Innovation Studio are all aimed at training individuals to effectively execute a common vision whether they are working individually or in teams.

The Studio as a Professional Model

Most ambitiously the Innovation Studio is concerned with changing current practice. Surprisingly, in the professions integrated teams like these are more the exception than the rule. Most professional programs are only a little better along - exploring the necessary skills, but not adequately training their graduates in the exercise of those skills. Through the Innovation Studio we are trying to address these shortcomings in several ways.

First, we are training the next generation of designers to be capable of collaborative work, and indeed to expect it in their careers. Second, through our interactions with expert participants we are trying to influence_ professional practice directly. The Innovation Studio has access to an unusually broad

audience because of the scope of the projects we undertake. Each contact serves to educate the students, but is also treated as an opportunity to educate our collaborators. Design reviews expose stakeholders and business professionals to concrete design alternatives. Brainstorming sessions share useful collaborative tools for current professional teams. Public presentations and competition entries are aimed at stimulating wider discussions amongst policy makers and communities.

If these kinds of contact are embedded in the studio experience, the Innovation Studio is also beginning to engage in professional work. Last year, the Studio was asked to join a professional team in the Fresh Kills landfill competition.⁵ The team passed the first round, in part we believe, because the proposal shared our vision of the landfill as public amenity. Closer to home we are meeting with policy makers and business people in Rhode Island to explore opportunities for the Innovation Studio to provide consultative services for municipal agencies, community groups and industry associations.

The Future

The Innovation Studio Program is committed to continuing to develop and refine its programmatic, pedagogical and professional ambitions. Over the coming years our efforts will be primarily directed at refining the pedagogy, as it seems apparent that such efforts could yield significant results in the other arenas. To accomplish this end we are working closely with the Institute for Civil Infrastructure Systems. Since 2000, ICIS has offered financial and networking assistance to the Innovation Studio. Through ICIS' close affiliation with New York University we have been developing a working relationship with the Wagner School of Public Policy. In the coming year policy and planning students will be given the opportunity to fulfill their thesis requirements by working with the RISD studio. Over the next two years we hope to develop a relationship that exposes designers and policy makers to their shared problem solving skills, and enhances their ability to work across their disciplines.⁶

At the same time, we are continuing to develop close ties with industry, both as a source of expertise and as an audience for the student's efforts. We are applying for a number of grants to bring technical and scientific experts to work with the students to develop more plausible programmatic innovation. Finally we have begun to explore opportunities for the Innovation Studio to provide direct consultative services in Rhode Island (and beyond). These efforts will be aimed at both community groups and state and local bureaucracies in order to help define more productive ways to integrate community issues into the design process and to begin to alter the current regulatory environment - one which frequently impairs comprehensive design thinking

1 The Innovation Studio was begun at RISD, in 1999 with an Educational Development Grant written by Lill Hermann, who was then Head of the Landscape Architecture Department, to create a venue for interdisciplinary design projects open to students throughout the college. The grant was used to bring Michael Singer, an award-winning artist, to the school to develop and co-teach a design studio with Charlie Cannon, an architect who had been teaching in the Industrial Design Department.

2 An eco-industrial park is an industrial park in which the outputs of each manufacturing facility are used as resources by adjacent facilities

3 Leachate is the liquid that collects at the bottom of the landfill. It is the result of the percolation of precipitation, uncontrolled runoff, and irrigation water into the landfill. Leachate can also include water initially contained in the waste as well as infiltrating ground water.

4 Daily cover refers to dirt and fill that is used to cover trash deposited into the landfill in order to reduce odor and pests.

5 The Fresh Kills competition team was a joint venture between Gensler Architects, RFR design engineers, Michael Singer, Margie Ruddick landscape architecture, the Sam Schwartz Company and Hill Environmental Group with Charlie Cannon and the Innovation Studio participating as design sub-consultants.

6 Since 2000, ICIS has offered financial and networking assistance to the Innovation Studio Program. By 2005 we hope to bring on a civil engineering program as well.