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Teaching collaborative and interdisciplinary service-based urban design and planning studios

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ABSTRACT

This paper describes a collaborative interdisciplinary studio approach to teaching practice. These studios have engaged students, faculty and, in most cases, clients in real-world problem solving activities ranging from an integrated plan-design-build urban redevelopment projects to regional scale analyses and plans. It was found that integrated service-based learning projects were of benefit to students and communities alike if a specified set of criteria were met at the outset. Lessons for future pedagogy and research are derived from the findings.

Introduction

Since the resurgence of studio teaching in urban design and urban planning programmes since the 1990s, there has been a recent emphasis on studio pedagogy. While studios were fundamental to the US and other Anglo-Saxon and European urban planning curricula in the first half of the twentieth century, their decline from the 1960s to the 1980s reflected the overriding emphasis on the social science nature of urban planning as taught then (Long 2012). The resurgence of New Urbanism among other factors reinserted urban design into professional practice and therefore its pedagogy. It is timely to review and reassess these issues now.

This paper presents in a critical context a collaborative studio format tested in 1999 and refined over 15 years. These studios have engaged students, faculty and, in several cases, clients, in real-world problem solving activities. Seven of these studios prepared urban redevelopment plans and designs. Two others developed regional scale analyses and plans. All were conceived/co-conceived and led/co-led by the author.

Studio teaching is perhaps the most challenging and most rewarding environment for actively engaging learners in the practice of place-based problem solving. Studio teaching is student-centred, where the student is actively engaged in learning, opposed to teacher-centred, where the focus is on the teacher's lectures and classroom presentations (Barrows 1986). This distinguishes it from traditional lecture and seminar teaching, which is teacher-centred. Studio teaching is problem solving through design. Design is understood broadly

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beyond physical design of buildings, landscapes and places, including that of organizations, processes, programmes, etc. Thus, the practices and precepts reported here can be applied to fields other than urban planning, including health, education, social services, public policy, public works and engineering, among others.

Collaborative studio teaching is unique and differs in important ways from typical classroom teaching. This is largely due to its complexity. Collaborative studio teaching adds layers of complexity in at least four ways: first, by interacting among disciplines for both students and faculty; second, by solving multi-factor real world and place-based problems in dynamic contexts; third, by working with a community-based client or constituency directly; fourth, by engaging the community collaboratively in the inter-disciplinary processes of learning and design. When done well, this results in co-learning and co-problem solving by all participants. Thus a collaborative interdisciplinary studio consists of a group of participants who come from three or more different disciplines that work together at the same time and in the same place (studio and site) to collectively elaborate a common project.

Transforming teaching challenges into learning objectives

The challenges facing these types of collaborative, service-based urban planning and urban design studios are multiple. These challenges are key learning objectives and include:

(1) Understanding complex and constantly changing problems.
(2) Gaining multi-disciplinary and multi-scalar understanding of the contexts and conditions.
(3) Instilling multi-cultural understandings of the contexts and participants.
(4) Team building and team work to guide analyses and solve problems.
(5) Crafting multi-disciplinary and multi-scalar analyses and solutions.
(6) Designing and managing these dynamic challenges in real time.

The first point, understanding the problem, often occupies up to half the learning time (semester), and in fact continues throughout. The second and third points refer to how to attain the understanding upon which the analysis is based. "Each individual discipline is of limited value in responding to the range and diversity of contemporary urban issues" (Mostafavi 2010, 29). Multi-disciplinary understanding is hard because of the careers and methods invested in discipline-specific approaches. Walls and beliefs need to be breached and bridged. New vocabularies need to be developed and adopted.

Multi-scalar understanding mostly refers to urban space and the built environment, from an individual building or parcel, through the neighbourhood and district, to the city, metropolis and region (Neuman 2007; Mostafavi 2010). This spatial context extends far beyond the site and its immediate environs.

The third and fourth points refer more to the studio participants and community members. Given the diversity in the classroom and the cities in which the projects occur, multi-cultural understanding is central. Like the multi-disciplinary challenge, the multi-cultural challenge entails breaking down received cultural knowledge and building bridges and vocabularies for common understanding. Ways of seeing and learning are ingrained through culture so deeply that students and practitioners seem blind to them unless confronted by other

cultures and epistemologies. Team building and teamwork are specific and essential skills to this type of collaborative and multi-disciplinary studio and its success, and thus programmed into the syllabus. Designing and managing these challenges in real time is in essence the instructors' craft and the aim of this paper.

Increasingly, planning and design schools are addressing these challenges with inter-, cross- or multi-disciplinary studios. While some argue for a distinction among these three adjectives, for the purposes here, the term 'interdisciplinary' signifies different disciplines working together and individually on a design problem. Optimally, these disciplines meet at the same time in the same space. At other times they approach the problem separately, and come together only at certain points, whether periodically and/or at mid-term and final reviews. It is noted here that in each of the nine studio projects undertaken, the number of disciplines ranged from five to twelve, in excess of the typical such studio that may engage two or three.

Prior literatures

Scholarly discussion of service learning, community collaboration and problem-based learning treats interdisciplinary collaboration among students and faculty, and with citizens and neighbourhood or interest groups. A classic text is by Barrows and Tamblyn (1980), which explicates the framework adapted in and adopted by many of the scholars listed in this review, and by the author in the conduct of the studios reported here. In the medical field, some of its principles have broad applicability. Barrows' follow-on article presents a taxonomy of problem-based learning that is useful for those who set or evaluate curricula as well as for individual instructors. The taxonomy of six methods illustrates the wide variations in quality and in the educational objectives that can be achieved through problem-based learning. These six are lecture-based cases, case-based lectures, case method, modified case-based, problem-based and closed-loop problem- based (Barrows 1986, 483). This "taxonomy is proposed to facilitate an awareness of these differences and to help teachers choose a problem-based learning method most appropriate for their students" (Barrows 1986, 481). The studio methods reported here represent a modification of the closed-loop problem-based learning, which is an iterative and recursive process described in urban planning and design pedagogy terms as 'reflective practice' (Schön 1983). Schön elaborates closed-loop as a process whose learning is fed back into successive iterations of the learning process.

In urban planning, Shepherd and Cosgriff (1998, 348) refer to problem-based learning as a "bridge between planning education and planning practice". Salomon refers to a different kind of bridge that a design studio or a design thesis forms between research and practice-based learning. To Salomon, "both design and research are understood as personal, creative acts that simultaneously produce aesthetic artifacts, directly engage extra-disciplinary issues, and are guided by personal and political considerations" (Salomon 2011, 42). The studios reported herein cross both bridges, and to a great extent integrate them, in that (1) fully one-half of the time budget of the semester is spent in data gathering and analysis (research), and (2) students continually conduct research to develop and assess their designs and plans, separate from the explicit data gathering and analysis phases.

Forsyth and her co-authors go as far as to highlight differences among planning, architecture and landscape architecture (Forsyth, Lu, and McGirr 2000). The current study found that despite differences among disciplines and the notable challenges

to interdisciplinary collaboration, the learning that took place and the quality of the product, as measured in client satisfaction and client use of the products, mitigated the costs. These costs can be largely but not exclusively considered as transaction costs as conceived in institutional theory. More importantly, the learning value added by a collaborative and interdisciplinary approach includes many intangibles stemming from local knowledge and special treatment.

As recently as two decades ago, in *Emerging Problems of Practice*, Robert Gutman identified six shifts in the professional practice of architecture, and in so doing scarcely mentioned interdisciplinary activity (Gutman 1992). These six are: (1) the growing prominence of the firm; (2) a countervailing tension; (3) diversity of organizations; (4) invention of auxiliary strategies; (5) growing social stratification; and (6) career planning (Gutman 1992, 198). The shift to interdisciplinarity has taken place largely over the last 20 years, in part led by urban design and planning, inherently interdisciplinary. Urban design and planning scholarship on and teaching of problem-based learning is increasingly robust, and this paper reports on advances in the *integration* of several factors.

To put these advances in context, Wu and Brooks' contribution (2010) to the writing of pedagogy articles offers three types: "conceptualization of issues related to planning education", "assessments of the state of planning instruction and curricula" and "accounts of specific cases and teaching innovations" (401). This paper addresses the third type and reflects, in the mode of a reflective practitioner, over 25 years of the author's own learning from collaborative and interdisciplinary studios (Schön 1983). These types of service-based learning projects have long been defended in the planning academy (Spain 1992).

The method of reporting the findings herein is a variation of 'N of one plus some' as described by Mukhija. In this case, N = the number of cases studied. 'Plus some' means one case is reported in depth, and a few other cases in less depth to corroborate or provide nuance for the main case. The focus is on depth, not breadth (Mukhija 2010, 419). In this paper, the method of conducting the actual studios was grounded in a composite conceptual framework based upon Schön (1983), Spain (1992), Zeisel (2006), Lang (1983), Sanoff (1978) and Freire (1970). It was a necessary prerequisite to the other modes of integration identified in the six 'challenges' above.

Schön's (1983) relevance to the conceptual frame stems from his 'reflective practitioner', one who deeply reflects on the problem and how to go about solving it while designing options to solve it. Spain's (1992) contribution is to articulate and defend the multiple links between teaching, research and service as a step towards their integration. Zeisel's (2006) design thinking approaches design not as an outcome but as creative thinking that is used to solve complex problems that logic alone cannot.

Lang's (1983) behavioural approach highlights the human factors that are central sources of evidence to serve the process of design, and as central criteria by which to measure the designed outcome's success or failure. He specifies this basis while arguing for the importance of including studios and workshops in urban planning curricula at a time when it was not common to do so. Sanoff (1978) presents an early framework and method for integrating urban design and architecture with community participation. Freire's (1970) 'pedagogy of the oppressed' refers to empowering the disenfranchised in community-based learning, which the current study extends to design and planning, an advocacy approach in a different context akin to Davidoff (1965).

In so doing, this present work attempts to respond to Baum's (1997, 21) challenge: that few teachers describe what they do, how students responded, what students may have learnt and what the teacher may have learnt. These points serve as a loose template for evaluating the lessons learnt in the discussion.

Evaluation framework

To assess the benefits of different disciplines working together on the same project in a studio setting, and learning together in the same studio space at the same time, two rigours – one of employing in studio a strict project development method / process throughout the teaching semester, coupled with meeting four consecutive hours, three times per week under the direct tutelage of the studio masters – form the basis of a critical evaluative framework by which to assess the pedagogical effectiveness of the studio format.

The first rigour, the project development method, employed an urban design and planning methodology for the students to follow. This was based on design methods and planning theory material learnt in seminar classes and synthesized by the studio instructor into a sequential, phased process. The second rigour, collective studio meetings three times per week for a total of 12 hours of common student-instructor face-to-face interaction / critique, was highly valuable for peer-to-peer learning as well as a deep immersion into the site and the problem. This programmatic platform provided the foundation for the six criteria listed below that form the evaluative framework to assess learning outcomes. These frameworks included:

(1) Integrating ecology and sustainability into urban design in a scientific and systematic way.
(2) Integrating planning (including analysis at larger scales) and design (landscape, architecture, urban and regional) into a more seamless construct.
(3) Integrating infrastructures (green and grey) into planning and design.
(4) Integrating the stakeholders in a service-learning mode by collaborating closely with community members and other interests.
(5) Intervening at a larger scale – urban, metropolitan, regional – than single projects.
(6) Integrating planning and designing at multiple scales at the same time.

The integrative and interactive practitioner

While urban design and planning attempt to be integrative by definition, via their principles such as comprehensiveness and evaluating the interactions among components in the urban system, along with coupling analysis and problem setting with synthesis and problem solving, the six criteria listed above suggest degrees of integration that are concomitant to urban planning and urban design studios. In this way, integrating scope and methods, coupled with high degrees of interaction with stakeholders representing an array of interests, immersed students in a demanding problem-based learning environment.

Problem-based learning is integrative and interactive by definition. If done in active collaboration with a community, several levels of complexity are added to the integration and interaction. One level of complexity includes community participants: interest groups, community groups, municipal agencies, utilities, transport agencies, school districts, other

entities and individuals. Integrative, in the context of urban design and planning studios, refers to several types of simultaneous attempts at integration, which raises the level of complexity dramatically.

Some curricula save this type of studio or project until the final semester of study, in order for students to learn one step or several steps at a time the individual 'building blocks' such as site planning, cities, infrastructure, ecosystems, collaboration and so on. Other curricula favour immersion into interdisciplinarity from the start. A valuable piece of research on learning performance outcomes would be to empirically test and comparatively assess, using common criteria, different curricular approaches to interdisciplinary studio learning.

Interactive, for urban design and planning studios, means not only interdisciplinary interaction but also direct contact and interaction with the clientele at the grassroots level. This style of learning starts with problem defining, a most critical step in problem-based studio learning. In place-based studios, learning from the place and its peoples is paramount. Ethnographic, demographic, social statistical, site analysis and participant-observation measures are among the methods here.

The goal of community-learner interaction is a Freirian ideal, in which the community members become co-learners with the students and faculty (Freire 1970). A guiding principle for the students was to 'listen to what the city and its citizens were telling them'. This was made explicit at the outset and reinforced throughout. This mirrors the finding of Sletto (2010, 403), whose reported experience in service learning was that learner disposition is key: "learning to embrace the unexpected through service learning".

This goal has been made more explicit in the work of cognitive theorists regarding educational approaches for what is called here the service-based studio learning project. According to Long (2012, 444), educational theorists have developed the "concept of 'thick authenticity' in practice-based learning. Cognitive theorists refer to as a 'thickly authentic' educational experience as one where 'personally meaningful projects are produced and assessed according to the epistemological and procedural norms of an external community' (Shaffer 2003, 40)".

Furthermore, this study found several instances (Chinatown, West Berkeley and Palacios, Texas) paralleled Sletto (2010, 411) in another respect, that of building client capacity: "The project arguably did more to facilitate the work of [the studio client]".

In all cases the studios used as a baseline for spatial ecological data the McHargian 'layer cake' method of ecological analysis, implemented using GIS and other spatial imaging software, and expanded to include infrastructural, social and other factors as conditions warranted. Gazvoda (2002) elaborates on the incorporation of this method into studio teaching for ecological data.

The importance of savvy project selection to enhance learning by increasing student and client engagement

A good project makes for good learning and a great project makes for great learning. Conversely, a bad project makes for bad learning. What criteria can be applied at the outset when selecting projects for collaborative and interdisciplinary problem-based studio learning? Exposing students and the community that they plan and design *with* requires new

ways of thinking and acting, compared to selecting a project that will simply be conducted in the studio without community engagement and without interdisciplinary interaction. The projects presented here were selected to test the hypothesis: the more challenging the project and the more open-minded and engaged the community, then the more profound the learning. Therefore, the project here sought for urban redevelopment studios in the poorest and most diverse communities (West Berkeley, CA; Palacios, TX; downtown Bryan, TX; and Redfern, NSW Australia). In ecological regions, among the most conflicted (Texas Gulf Coast and the Louisiana Gulf Coast), and in urban mega-regions, a singular one (Texas Urban Triangle). Two other studios conducted by the author were in Berlin, Germany, and Barcelona, Spain.[1]

These environs and conditions tended to be far outside the norm of the typical student, so that they had to stretch their own horizons to understand what they came into contact with. In all cases it was found that the greater the distance from their comfort zone, the more they learnt, and the more they were able to cast their prejudices aside (after a while, in many cases) and craft interesting solutions. From student feedback, this occurred to the extent they were able to see the place 'freshly', putting aside as much as possible preconceived notions or standard solutions that they may have brought from their own backgrounds, including their own disciplines. Instructor intervention to expose innate biases and contextualized new situations entailed constant vigilance.

In most cases, another key criterion was extremely strong commitment from the client and community. This commitment was expressed in two ways – financially and person-hours. In the majority of the cases reported, between $20,000 and $50,000 was received for a one-semester project. In two cases, Louisiana Gulf Coast and Palacios, citizen and interest group participation was particularly extraordinary, and are sketched below. As a long-time grassroots activist-planner and urban designer inspired and taught by Martin Meyerson, Jon Lang, Ian McHarg, Manuel Castells and Christopher Alexander, and steeped in the cross-acceptance cauldron of the first New Jersey State Plan, the author endeavoured to profess what he practised. In the author's experience as a student and as a teacher, intensive community participation in studio projects had by far the biggest impact on the students and their learning, compared to typical classroom settings.

In two cases, the Texas Urban Triangle and the Louisiana Gulf Coast recovery plan, there was no explicit client at the outset, so these two projects were more exploratory in that there was more freedom to identify problems and propose solutions. That is, the freedom due to a lack of client constraint was correlated to the level of daring in the analyses and designs in these two projects. In the author's view, it was a prime factor in their capturing attention at the state and national levels, such as appearing on the Mayor's and Louisiana Recovery Authority's desks, winning state and national awards, and being the object of attention at numerous state, national and international meetings.

This suggests that the criteria for project selection are capital to the quality of the learning outcomes, whether self-assessed (end of semester course evaluations) or peer-reviewed (national and state awards). This was identified by William Alonso (1986): "Current emphasis on studios with an actual client, such as a local agency or community group, both facilitate the incorporation of public service into the classroom and demand academic rigor" (69).

Case study without client: Rebuilding a sustainable Gulf Coast: a regional plan for New Orleans and environs

Six disciplines were represented among the 19 students: urban planning, urban and regional science, architecture, civil engineering, construction management and geography. The final products were a land suitability assessment, an urban and regional analysis and an urban and regional design plan. All students met in the same room at the same time each class period.

Genesis of the project

This project grew from the needs occasioned by the dramatic devastation of hurricanes Katrina and Rita in 2005. The project settled on a point of view guiding an inquiry and designs based on a locally informed synthesis of ecology and social justice. Those involved endeavoured to 'listen to what the place was telling us', as well as to respect the common wisdom offered by nature itself. The students' designs sought to balance a range of concerns that would support both local and visiting populations, that would respect human, ecological and economic concerns, and that would benefit current and future generations. Support was received from experts at the Louisiana Universities Marine Consortium in Cocodrie. Because there was no nominal client, a path was chosen with high degrees of freedom, unfettered by external constraints. The approach and the result could be said to mirror the motivation of using studio pedagogy as 'insurgent planning' provided in Sletto's case study (2013).

The project

Given the unique history and ecology of Louisiana Gulf Coast, rebuilding for the future must be sustainable to avoid the disastrous consequences of another hurricane that is sure to come. The students engaged in analyses, prepared scenarios, assessed the scenarios and prepared specific plans and designs at six different scales:

(1) Region – the eastern half of the state's coastal region south of Interstate 10
(2) New Orleans metropolitan area
(3) City of New Orleans
(4) Neighbourhoods
(5) Blocks
(6) Structures

The student report, *Rebuilding a sustainable Gulf Coast: A regional plan for New Orleans and environs*, was presented in May 2006.

An overview of the existing situation

The Louisiana coast is extensively developed and scarred. Its natural functions have been degraded over 150 years by well-intentioned but ill-conceived engineering proposals to tame the environment (McPhee 1989). These pre-existing conditions worsened the impacts of the storms. As a result of extensive readings and an eventful three-day site visit along the entire Louisiana Gulf Coast from Cameron on the west (which Hurricane

Rita destroyed) to New Orleans on the east, (which Hurricane Katrina ravaged)[2] all those involved quickly became convinced that the causes of the devastation were based principally in regional and environmental factors.[3] This differed markedly from the usual culprits singled out by the media and emergency response officials – the levee breaks. This recognition became a strong motivator to explore even further the intertwined ecological and socio-cultural dynamics of the region in order to produce plans and designs that would serve both people and nature.

As a direct consequence of the wide scope and multiple scales of analysis, the students found that the flooding problems were not only caused by engineering mistakes and faulty design and construction of flood protection infrastructure. They found that the degradation of natural systems, such as the coastal wetlands and barrier islands, due to human interventions, including oil and gas pipelines, shipping channels and canals, and channelling the Mississippi River, significantly contributed to the worsening of the storm's impacts on Louisiana Gulf Coast. Because a regional analysis was undertaken at multiple scales instead of merely building or neighbourhood analyses conducted by most other experts after the storms, regional causes were found for local consequences. All this conditioned the learning and the author's pedagogy profoundly.

The pedagogical process employed in the reported cases

Intensive interdisciplinary interaction

In addition to the three-day field trip at the outset, students and faculty from six disciplines collaborated. There was one senior honours student, five doctoral students, and thirteen masters students from ages 20 to 40. The students treated each other as peers, regardless of their background, making collaboration easier.

Visits to the class were made by coastal and sustainability experts. They reinforced that single-discipline solutions of the past contributed to much of the devastation, and that multi- and inter-disciplinary collaboration is essential for remedies that are sustainable far into the future.

Intensive discussions each session allowed thinking to evolve from disciplinary to interdisciplinary over the course of the semester. Discussion evolved sometimes as a smooth flow, sometimes in starts and stops. The latter was often the result of not letting go of discipline-bound learning. Focusing on a pragmatic task, such as choosing the six goals of the plan listed below, most revealed to the students the value of collaborative and interdisciplinary interaction in reaching consensus, rather than exhortations and readings that point to its need. The six goals required grasping, acknowledging and weighing trade-offs among perspectives and values. In so doing, student bargaining became a valuable pedagogical tool to promote interdisciplinary learning.

(1) To restore the functioning and integrity of ecological habitats while maintaining coastal water quality and species diversity.

(2) To rebuild New Orleans as a regional centre for Southern Louisiana and beyond.

(3) To build new flooding and storm surge defences for the city and environs.

(4) To enhance the safety, appearance, functioning and sustainability of infrastructures critical to the rebuilding of the city and environs.

(5) To address social and economic equity concerns in the rebuilding process, as disadvantaged neighbourhoods and areas were disproportionately affected.

(6) To rebuild viable neighbourhoods using ecological planning methods and sustainable housing designs.

Integration

Using integrative thinking processes and practices also aided this pragmatic pedagogical approach to encourage different disciplines to work together. Two examples illustrate this principle. First, the field trip revealed a glaring gap in organizing and managing the recovery: "who's in charge?" a student asked. Nobody, at least in any effective manner, was the answer. A student commented: "A Coast Guard officer [who was put in charge] – what does he know about city and ecological planning? Infrastructure? Rebuilding?" The students struggled mightily with the question of who coordinates and mediates the alphabet soup of agencies at all levels of government.

The students' approach was reinforced by their own readings and collective in-class interpretations of the media, and the inter-agency blame game had much to do with disciplinary turf wars. They realized that their own policy and planning proposals had to overcome this limitation and be crafted collaboratively. Frequent in-class presentations and constructive criticism in a nurturing learning environment (that is, beta-testing in a peer forum) that encouraged lateral thinking and boundary spanning ideas were key pedagogical techniques employed to further integrative thinking.

The second example of integration involves the selection and use of analytical tools. The students grappled with a near-Herculean task: to integrate McHargian suitability analysis (McHarg 1969), Formanian patch analysis (Forman 1997) and risk analysis (Zahran et al. 2008) into a single comprehensive spatial tool at the regional scale. This task involved superimposing, by using GIS, dozens of environmental, physical, social, economic and vulnerability factors in order to determine the most suitable spatial locations for identified types of development (urban, ecological and so on). While the foundation technique is referred to as McHargian in recognition of Ian McHarg's pioneering contribution, Forman's patches were incorporated because of the discontinuity of the presence (patches) of certain factors in the regional landscape. Risk analysis assesses the degree to which certain human population categories (socio-economic and demographic characteristics) were vulnerable to natural events such as hurricanes and flooding. These three methods – suitability, patch and risk – were integrated for the first time, as far as is known, in this project to develop a composite analytical method.

Because students were from many different disciplines, all relevant to the three individual analytical tools and their attempted integration, only their collaboration could make it possible. The pedagogical technique employed for this effort was exploratory collaborative research directed toward the integration of existing single-discipline tools. Much trial and error and multidisciplinary review moved this integration forward.

Overall, circumstances other than instructor effectiveness may have been the decisive factor. A massive disaster, one of the worst in the nation's history, so close and so fresh, clearly revealed and reinforced the need for our pedagogical approach – novel and exploratory, collaborative and interdisciplinary. Every outside datum supported the students' emergent approach to the project. In the end a tremendous degree of self-motivation carried the

day. Knowing that their work would end up on leaders' desks (FEMA, Louisiana Recovery Authority, governor, mayor) was another key motivator.

Case study with client: The city of Palacios urban design plan

Five disciplines were represented among the 25 students and three among faculty: urban planning, landscape architecture, architecture, nautical archaeology, and recreation, parks and tourism. All students participated in several two-day field trips to Palacios. As the semester progressed, students travelled individually and in small groups to the town to gather more data and to interact with the residents in greater depth. The recreation, parks and tourism and the nautical archaeology students joined the planning and landscape architecture students in class on campus only at critical periods, yet participated in all the field trips and presentations. At the outset this separation was a problem in coordination and in common understandings of the situation. As the semester progressed, more direct contact and collaboration occurred, yet retreated at the end as individuals worked on their own contributions independently.

Overview of the existing situation

The city of Palacios is located on Tres Palacios Bay in Matagorda County, halfway between Houston and Corpus Christi. The city had a population of 5000 inhabitants, approximately 15% Vietnamese, 35% Anglo and 50% Hispanic. Palacios was known as the Shrimp Capital of Texas until the recent economic downturn. It is a community rich in coastal resources from oyster beds, shrimp fisheries and recreational fishing, to an extensive waterfront park system, a port that boasted the second largest shrimp fleet in the state and a Marine Education Centre.

Several years before this studio, the Palacios Beautification/Revitalization Committee, a citizens committee formed at a 1999 town meeting, coordinated the Palacios Coastal Enhancement Master Plan. This Urban Design Plan Project followed up the Master Plan, and was conducted in a partnership consisting of the city of Palacios, the Palacios Beautification / Revitalization Committee, Matagorda County Navigation District #1, the Palacios Seawall Commission, Palacios School District and Texas A&M University. The town's recent history of partnership and collaboration was a critical prerequisite for successful collaboration with the students and faculty during the studio.

Description of project

The Urban Design Plan proposed detailed urban designs for four areas in the city: the waterfront, Main Street/downtown, the State Highway 35 bypass and the hike and bike trail. The general goals were to enhance environmental, social and economic sustainability. The four specific goals of the plan as identified by the client are:

- To improve the shoreline while maintaining water quality.
- To improve Main Street as a centre for shopping and entertainment.
- To create a new hike and bike trail connecting all parts of town.
- To enhance the safety, appearance, and traffic flow of Henderson Avenue/State Highway 35 bypass.

The pedagogical process

Extensive grassroots public participation

The planning process centred on intensive student-citizen grassroots collaboration. Over 150 Palacios residents collaborated with us directly over the course of the project. Eight residents of Palacios came to the university to review the students' proposals as they were being developed. Students and faculty spent a total of 140 person-days in Palacios, three hours by car from the university.

There were three meetings in Palacios by the instructor prior to the outset of the semester, including one of a full day, with the four citizen groups organized to coordinate citizen input on each of the four key elements of the plan identified by the City and the non-profit Beautification and Revitalization Committee. The citizen groups were the Hike and Bike Trail Committee, the Main Street / Downtown Committee, the Waterfront committee and the Henderson Avenue Bypass Committee. The main topic was the process of citizen-student collaboration.

Because of the lay nature of the citizenry, it emerged that the best way to communicate would be by not using technical (disciplinary) jargon but in a non-disciplinary way. This stance opened the door wide to dialogue unbound from the professions, and facilitated student and faculty interdisciplinary collaboration.

Five open public meetings were held at critical stages in five different venues: the Palacios High School, Recreation Centre, Vietnamese Community Centre (first general public meeting ever held there), Palacios Public Library and Texas Baptist Encampment. Attendance ranged from 60 to 150 persons, and simultaneous interpretation was offered in Vietnamese and Spanish in two of the meetings. Simultaneous interpretation opened up new lines of communication among the city's diverse cultural communities. Seventeen other meetings were held among faculty, students, town leaders, interest groups and citizens.

A total of 1350 surveys of 35 questions about existing conditions and what should be done to improve the town in the future were completed and collected in a town of 1700 households. The survey, translated into Spanish and Vietnamese, was administered through public school students who took them home to their parents as a class assignment. One survey was given to each student in the first through to twelfth grades (700 were returned in a school district of 1600), and sent home to the parents of the oldest child in the family attending a Palacios public school. This effort was coordinated by the school district and the public schools with full participation of the superintendent and the principals. Palacios students also took part in class discussions about the future of Palacios, and attended public and subcommittee meetings.

The non-disciplinary means of advancing dialogue and collaboration established at the outset proved to be the most important pedagogical decision, after insisting on intensive and extensive citizen participation. The process began as and continued to evolve into a true multi-organization partnership. This project was clearly a case of planning as an agent of social change (Castells 1982).

Enhance the civic and planning capacities of the city and citizens of Palacios

The plans and designs were prepared collaboratively with the citizens of Palacios, led by the Beautification and Revitalization Committee and its four subcommittees established expressly to work on this plan. These five committees met numerous times during the

semester-long process, as well as before the student involvement began, and continued years afterwards. These committees were responsible for the continuation and institutionalization of the planning process begun by the students. Other key participants included relevant city, county and state agencies, City Council, public schools, the school district, library and other interested parties. Collaborative planning built the planning capacity of the city, which had and has no planning or development staff, and its citizens. Due to the foresight and openness regarding civic engagement, the mayor and council used our process explicitly to build civic capacity of many types, again underscoring Sletto's (2010) finding.

In addition to the urban design plan and the tourism assessment, students also delivered separately a draft zoning code and a draft historic preservation code. These codes were the city's first, and were adopted after a new city charter was passed shortly after (and partly inspired by) our studio. The project involved members of the community – the Vietnamese – who had never been engaged in public policy making or planning before. The project engaged public school students in city planning for the first time. It also made strides in bringing all cultural and age groups together.

Improve interdisciplinary collaboration using sustainability

For *environmental sustainability*, the students proposed a Wetlands Education Centre, and proposed connecting an existing Wetlands Park by bike trail to the rest of the city. The bike trail is designed of recycled materials to permit school students to bike to school, relieving car commuting to school. Recently the city was awarded a state transportation grant to build the bike trail. These efforts brought together biologists, bikers, parents, children, police, public works engineers and a wide range of others. Interdisciplinary collaboration was a must, and the presence of the youth was an inspiration to the other participants.

For *social sustainability*, the process brought together all cultural and age groups to the table to discuss and decide future options. Civic capacity was built and engaged with ethnic groups long absent from policy making. The Henderson Avenue Bypass redesign is safer due to the addition of a landscaped median, installation of traffic signals, crosswalks and sidewalks. These efforts brought together virtually the entire city, and the Bypass redesign brought multi-scalar thinking into the interdisciplinary mix.

For *economic sustainability*, the students proposed slow and gradual tourism development that does not change the small coastal town's community character. The Main Street improvements are designed to enhance the pedestrian experience and entice residents and visitors downtown. Like social sustainability, economic sustainability debate brought together virtually the entire city, as it was the poorest in the state with the highest unemployment, even in the midst of a widespread economic recovery. The creative and entrepreneurial thinking that went into the local economy, which is strongly tied to the town's identity (see below), benefited from broad participation.

Develop the identity of Palacios using the Urban Design Plan

The overall process of intense citizen involvement, plus the survey responses, led to the growing definition of a unique community identity for Palacios. Known before as the 'City by the Sea' and the 'Shrimp Capital of Texas', residents now see themselves as a beautiful and laid back coastal town with a unique commercial fishing and tourism character. This

emergent identity had much to do with the level and quality of citizen involvement in the planning process.

In the spirit of collaboration with a diverse and historic community, the students and faculty engaged in a semester-long journey of design inquiry (Zeisel 2006). This motif, inquiry by design, was among the theoretical underpinnings of this studio, as enhanced by intense collaboration with individuals and interest groups at both the grassroots and institutional levels (Castells 1983; Healey 2006). One example of the degree of professional and cultural interchange was that each student was lodged in the family home of a local leader during our several weekend-long field trips, such as a council member, NGO director, school board member, etc. during each visit. Imagine the introduction into American local democracy by the mainland Chinese student who stayed in the mayor's home in 2003.

Findings: lessons for teaching collaborative interdisciplinary studios

The lessons presented here, as the accounts above, are inspired by Baum (1997): few teachers describe what they do, how students responded, what students may have learnt, and what the teacher may have learnt. These lessons represent student learning outcomes that span the full range revealed in the analysis of 22 US planning programmes surveyed in 2009–2011, in which 44 different studio courses were taught and reported by Nemeth and Long (2012, 480–482). The categories of these outcomes, as presented in Nemeth and Long's Table 2, are "communication, professional experience, learning by doing, problem solving, teamwork, and service". The students in the studios reported herein stay in touch and often report that they applied the methods learnt in studio to their later learning, studios and work. In more than a few instances, a typical student evaluation of the course included the statement that the experience "changed my life".

Building institutional and civic capacity

In the cases where there was an identified and engaged client, the building of institutional and civic capacity is a critical contribution of community-based service learning. The planning academy would benefit immensely if this under-reported facet of problem-based service learning were to be assessed rigorously in the future. Community benefits included establishing and strengthening strong and weak social ties, establishing and strengthening lines of communication, forming committees and commissions, and developing common bonds, values, identities and language. These were the key components in the evolution of civic and institutional capacity for the client of the Palacios studio reported here. Building these capacities is a lasting value-added outcome of collaborative service learning. Some literatures call this organizational learning, as reviewed by Ebrahim and Ortolano (2001). Via positive-feedback, organizational and institutional practices change through learning (see also the work by Argyris and Schön (1974, 1978), together and separately). The students saw capacity building in action, and often remarked on it in end of semester evaluations.

When a client was identified, it added a dose of realism that both tempered and fuelled the innovative fires of the students. Having a client tended to generate a higher level of commitment by the students, yet this is an anecdotal inference in that measures of this were not recorded. An exception to having a client was the Louisiana Gulf Coast after Hurricane Katrina project. This extraordinary circumstance was motivation enough, as the storm and its

aftermath dominated the media and the national conscience and consciousness for months afterwards, throughout the duration of the studio. Moreover, the issues addressed were far beyond those tackled in a typical studio, thus attracting adventurous students.

Using images to convey analyses and proposals that crystallize community thought and action

This study found that the principles espoused by Al-Kodmany (2001), to bridge local and technical information with visualization, to be very effective. Thousands of student-generated illustrations and designs spurred debate and crystallized thinking about the current conditions that they analyzed and the future proposals that they presented. They were most effective when presented and discussed in public and, more recently, posted on the Web. In West Berkeley, Palacios and Redfern-Waterloo, for example, the final presentations to the public included over 120 lineal feet of wall space covered with 3 x 4 foot (A0) or larger design panels, plus PowerPoints, videos, a physical scale model of 2 x 3 metres (Redfern) and 11 x 17 inch (A3) full colour final reports of up to 150 pages (in five instances).

In other words, these studios highlighted the importance of design-based planning, including design-based analysis. The importance of using visualization in community planning was underscored by Sanoff (1978, 1991). The findings here fully accentuate those of King et al. (1989), who stressed that using visualization as a common language to which all participants can relate is most effective. This approach reinforced the image-based learning of physical design students, and introduced planning and other non-design students to the intricacies of images and their pedagogical value.

Start collaborating at the outset, continue collaborating throughout

When students were taught from the outset (better still, shown with convincing examples) that collaboration is positive, necessary and solves problems in inventive yet useful ways, they were found to accept collaboration with different disciplines and community members and groups as normal. This held for both collaboration amongst themselves in an interdisciplinary way, and amongst clients and stakeholders. In several of the cases reported here, end of the semester public presentations, peer awards, student evaluations and implementation by the client reinforced the value of collaboration.

Essential to this type of interaction is to ensure that students and faculty from different disciplines meet in regular studio and class sessions at the same time in the same place. This amounts to a scheduling issue that may require significant advance planning, not only by the faculty members involved but administrators as well. Furthermore, it requires more than conviction and attitude conveyed consistently by the faculty. It also necessitates specialized training for faculty to *facilitate creative interdisciplinary collaboration*, which when these four words are taken together represents a cohesive set of techniques that are integrated by the instructors and inculcated to the students.

In these cases, support from faculty leadership, co-instructors and the students themselves, who were usually more than excited to engage in 'business not as usual' and allow their inquisitiveness and creativity to bloom, were all essential for whatever outcomes and learning gained. This support is not a given. Making sense of the different perspectives needs constant justification to colleagues and administrators in order to be supported more

broadly by faculty members. In some instances, faculty 'push-back' by members bound to tradition, and discipline played a role in the limited institutionalization of this approach into the broader curricula.

Conclusions: eight keys for collaborative and interdisciplinary studio learning

Overall, it was found that the more the following conditions pertained and were stressed by the studio masters, the greater the learning and satisfaction reported by the students and the clients. Thus they form normative recommendations for optimal conduct of studios of this type.

- *Multi-disciplinary*: working together simultaneously in place and time

Landscape architecture, architecture, urban planning and design are the disciplines most often found in the interdisciplinary mix in built environment studios. While they are themselves inherently interdisciplinary, they share more commonalities than differences, namely the built environment, being design disciplines and their own interdisciplinary nature. To be fully interdisciplinary, it is suggested that planning and design studios need to engage a fuller range of disciplines and approaches. A single discipline acts like the adage attributed to Mark Twain: "when all you have is a hammer, all your problems look like nails".

- *Multi-scalar*: dealing with multiple scales simultaneously

Planners know that analyzing and planning at multiple scales at the same time is integral to their craft. Yet other disciplines do not, or are just beginning to operate in this mode. The inter-penetration among all scales from hyper local (the building or site) to the global goes beyond formulations like 'glocal' (Swyngedouw 1996). This presents a leadership opportunity for planners and planning academics to lead other disciplines into this type of thinking and acting.

- *Problem-based learning*: addressing real world problems

Selecting current problems of real concern to the community is a critical aim of project selection and a critical component of project success, especially as measured by implementation. At the same time, teachers must link the problems to theory and methods. Sometimes this entails criticism or redefining of theory and its role in learning, a vital learning outcome itself. In grassroots processes, community members become co-learners with the students and faculty to create a coextensive learning community, broadening the learning environment of the studio or classroom, and thus multiplying its value.

- *Integrative*: synthesizing scales, interests, disciplines, theories and methods

Integrative, in the context of urban design and planning studios, refers to several types of simultaneous attempts at integration (they are always only attempts), which raises the level of complexity dramatically. Integration is a problem in itself that is part of the problem-based learning paradigm, at least as practised in urban planning. Managing pedagogical complexity via integration is a profound challenge to any instructor, regardless of experience, talent or intelligence, because of the exigencies of a short semester, the complexity of urban projects, the limitations of resources and knowledge, and the vagaries of the students and clientele, just to name a few. Nonetheless, integration is a hallmark of planning and is best imparted as a learning experience in a studio or workshop (Lang 1983).

• *Synergy*

Experience in all these projects that were co-taught suggested strongly that if there is more than one instructor, then each contributes to or should be *fully* bought into the choice of project, the overall teaching philosophy and the specific approach. Synergy in these regards is vital. If not, conflict and sub-optimal outcomes result. In addition, having the students and faculty meet at the same time in the same place is a critical, if difficult to achieve, requirement.

In these cases, synergy was reached when participants openly shared and learnt each other's perspectives, languages, methods and disciplines to the extent that a one-semester studio allowed. It was found that this type of engagement and interaction leading to mutual interaction was critical to attain the synergies mentioned above. In this highly specialized kind of learning environment, instructors provided tools for collaboration – listening, empathy, understanding, negotiation and conflict resolution – as an essential part of their teaching repertoire.[4] Supportive leadership in/across departments, schools and faculties was also essential in enabling such a learning environment.

• *Local knowledge*: interacting with local people and places

A guiding principle for the students was to 'listen to what the city and its citizens were telling them'. This was made explicit at the outset, and was reinforced throughout. According to student feedback, it was consistently ranked as an important, if not the most important, precept gained. In the internet age when most knowledge seems just clicks away, and the Web itself a crutch easily entangled in, 'being there' out in the community was seen by all learners as having no substitute.

• *Context*: regional and global factors affecting local conditions

Context is not only the surroundings and how they affect smaller-scale conditions. 'Inner context' turns context inside-out, and makes us cognizant of details that affect the bigger picture. Importantly, context in part embodies local and regional identity, critical to constituent identification with the planning process (learning process). Citizen identification is the prerequisite to supporting the planning process. Context also refers to being aware of institutional and political considerations. Doing so successfully goes far in enhancing civic capacity and building institutional capacity. Contextual awareness is foundational to learning, judgement and professional maturity. It forms more sensitive planners.

• *Sustainable*: increasing value across the board in the long term

Value here means pedagogical value. By its virtue of being a theme-in-action, sustainability single-handedly addressed all the aims of this list, as evidenced by the case studies. These include the privileging and use of local knowledge, the understanding and addressing of diverse contexts, the integration of knowledge and skills, the ecological view embedded in multi-scale intelligence, and drawing upon a wide range of disciplines and synthesizing their attributes. In these senses sustainability is an incubator for integration.

In sum, all eight of these conditions point to the multiple opportunities for planning educators to exercise leadership with respect to other disciplines in the conduct of place-based and service-based learning. Moreover, they represent the keys to expanding the prospects of all of planning's constituencies, so that long-term, comprehensive, contextual, multi-scalar and multi-disciplinary become habitual criteria for assessing and enacting urban planning

and public policy. If instilled, our graduates from these types of studios can extend these methods to practice and the communities they serve.

In problematic political and economic times, justifying planning to our constituents, including deans, provosts, presidents, legislators and the public at large is increasingly vital. Convincing accounts of community-based collaborative service learning that improves places, builds capacity and expands the learning horizons of citizens, students and teachers alike can provide a valuable tool to do so.

Notes

1. According to strict scientific methods, this hypothesis was not 'proven', just as there is no hypothesis of any kind that can be proven and only ones that can be disproven, according to Karl Popper's famous axiom. In these eight cases the preponderance of the evidence, of which only a small fraction was provided, even for the two cases presented, clearly suggested that the hypothesis is valid, for these eight cases.
2. "Unforgettable", "life-changing", "once-in-a-lifetime opportunity" were typical student end-of-semester comments about the field trip and the project, extracted from student evaluations of the course.
3. Required reading on the functioning of the Mississippi and Atchafayala Rivers and the extensive coastal wetlands of Louisiana, along with other materials related to the Louisiana coastal region and ecological planning and design, was contained in the course syllabus, including McHarg (1969); McPhee (1989); Benyus (1997); Chapin III et al. (1997); Daily (1997); Forman (1997); Vitousek et al. (1997); Camazine et al. (2001); Capra (2002).
4. The author has over 25 years of experience in researching, teaching, practice and writing about conflict resolution and negotiation in complex, multi-stakeholder circumstances, contributing to this capacity. Excellent sources for these approaches can be found in Susskind and Crump (2008), Forester (2009), Innes and Booher (2010).

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