in_visible cultures: An Evaluation of Interdisciplinary Project-Based Learning in Panama

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The theory and goals of interdisciplinary courses are well documented in the literature of the field. Acting upon an extraordinary opportunity to conduct a community-based, project-oriented course in Panama, we set forth to answer two important questions: what are the necessary elements in the development of course content and curriculum that lead to successful interdisciplinary outcomes? And, would further benefit result from an interdisciplinary approach to a real-world subject via site-based community learning? These two guiding questions – one about student learning, the other about the value of applied action research – structure this account.

The subject of review and evaluation is an experimental interdisciplinary research course on community and urban design which spent four weeks during Summer 2006 undertaking fieldwork in the El Chorillo neighborhood of Panama City, Panama. El Chorillo is a particularly poignant site in which to work as it was the target of the 1989 U.S. invasion *Operation Just Cause*. According to local residents, our course was the first time Americans had been seen again in the community (fortunately under better circumstances).

The following sections outline the genesis of the course and the project, its goals and objectives, an explanation of how the curriculum and course content were geared to interdisciplinarity, and an overview of the student research projects conducted. These descriptions are matched by a threefold evaluation: how the pedagogical goals of interdisciplinarity were met; of student learning as evidenced by their research work; and a discussion of the structural characteristics which led to a successful outcome.

in_visible cultures: The Course and the Project

The opportunity to work in Panama was extended by the Officina de Casco Antiguo, the agency overseeing the UNESCO World Heritage site in Panama City, with the interest of attracting faculty with experience in community design. Previous design studios had addressed physical planning issues in Panama City, but it soon became evident that simply nothing was known about everyday life in El Chorillo which could serve as the basis for community design work. Located between the Casco Viejo, the historic city center, and the former Canal Zone, El Chorillo is today faced with a major development challenge. Long treated as a backwater corner of the city, its location and reputation as a lawless and uncontrollable district had literally and figuratively isolated El Chorillo from the rest of Panama City. This context led us to speculate about the efficacy of an interdisciplinary course to develop innovative ways of gaining site knowledge and applying this knowledge to design.

For the purposes of this review, we will consider the effort as comprised of two vital components: the *course*, described in terms of student-oriented goals; and the *project*, defined as the directed action towards a community goal of appropriate design and development.

The course, entitled *in_visible cultures: art, design and public space,* grew from an intent to test, through action, the value of an interdisciplinary approach to pedagogy and to reveal the benefits of interdisciplinarity. These benefits were fourfold: an approach of *critical inquiry*, to examine and possibly restructure conventional modes of practice[1]; the *positive impacts* that multiple disciplines could bring to the application of community-based fieldwork; the development of *visual methodologies* as a form of arts-based research whose reflective investigations can strengthen urban design practice[2]; and relatedly, the *value of representation* of knowledge as a revelatory and reflective act. One particular strength of the pedagogical focus was the multidisciplinary natures of the instructors themselves; our formal backgrounds included architecture, landscape architecture, urban planning, graphic design, fine art, art education, education, anthropology and ethnography. The initiative included instructors from the Departments of Architecture, Landscape Architecture and Art Education, and graduate and undergraduate students from Architecture, Landscape Architecture, Art Education, Visual Arts and Geography. In addition, the group partnered with approximately 20 Panamanian Architecture students.

Initially, the project was loosely defined by the Panamanian partners. Ongoing work was directed to future redevelopment plans for El Chorillo largely from a formal and integrative standpoint – how would the district be fit back into the rest of Panama City? Our effort was directed towards analyzing and effectively representing internal 'invisible' conditions and linking this knowledge to design. The product was envisioned to be a representation of a greater understanding of the place and its dynamics. The subject fields – community and urban design – are traditionally multidisciplinary, drawing in their application from a variety of specific disciplines such as architecture, urban planning, landscape architecture and behavioral psychology.

The project, therefore, emphasized both the *product*, the application outcomes of the research and design applications, as well as the *process of inquiry*. The process of inquiry would seek to develop new tools and methods for knowledge production that would inform action. This places the effort in a middle ground between project-based action-research[3], which is traditionally seen to be the application of disciplinary and multidisciplinary methods to resolve conflicts between groups (in our case between El Chorillo and Panama City), and a course-based emphasis on re-structuring or liberating students' discipline based internal frameworks. The intent is that this applied learning experience will make students more sensitive and engaged multidisciplinary practitioners. These goals match the identified characteristics of successful outcomes for student service-learning projects: a focus on practical community-based problem solving, a meaningful connection to the partner community, and the opportunity for students to identify a civic role in that community[4].

Curriculum Planning and Content

In order to achieve the goals of interdisciplinarity, student learning and partner benefit outlined above, the curriculum was structured around a framework of four guiding questions. The first, 'how do we define a site?' challenges us to define our subject. The second, 'how do we gain site knowledge?' promotes a reflective process of inquiry about the acquisition of knowledge and presents the opportunity to develop new tools and methods. The third question, 'how do we represent site knowledge?' demands an active engagement with 'meaning-making', the act of 're-presenting' the knowledge gained. Finally, the link to action is secured with the question 'how does site knowledge affect design?'. It is important to note that each of these questions may then be applied at multiple scales: to El Chorillo, to the research projects themselves, and ultimately, to the bounds of disciplinary knowledge. These questions relate directly to a discourse of 'site matters' which values site knowledge and regards sites as both locations and vessels of information[5].

The particular structure of course activities was crafted around the six week course schedule; two weeks were conducted as a seminar in-residence, the remaining four weeks on-site in Panama City. The pedagogical model was an active learning, constructivist framework in which course activities function as steps for students to build interdisciplinarity. The first two weeks focused on *knowledge building*. The course reader fostered discussion and comprehension of theoretical and practical approaches from a variety of sources, including ethnography, anthropology, and novel approaches within the fields of visual culture and

community design. The strategy for this period was one of accretion of information applied to students' own disciplines, followed by a synthesis and restructuring of their disciplinary knowledge based on applicable ideas from other disciplines[6].

The four week fieldwork period focused on *action* and then *'meaning-making'* as a productive and reflective process. Students undertook a series of structured, revelatory activities geared to the larger course and project objectives. These included tours guided by local experts in history, design and planning, as well as active mapping of the El Chorillo neighborhood. As the students gained familiarity with the context, spirit and issues of Panama City, they were required to identify a problem or issue which was of disciplinary interest to them. At this point, students were well versed in their shared disciplines as well as those introduced in the seminar. The application of the project itself had been made tangible by their experiences in the neighborhood, and they had begun to develop an awareness that the issues they were confronting transcended disciplinary definitions and solutions. By engaging the students' personal experiences and disciplinary backgrounds with the problem at hand, their emerging research interests began to link their newly acquired knowledge with their existing knowledge in order to address complex problems, a hallmark of interdisciplinarity[7]. Research directions emerged as students analyzed, synthesized and evaluation their options, embodying a model of situated learning in which they began to confront the options their future professions would enable them to address[8].

Students developed, planned and implemented their research projects, grounding them in the theoretical backgrounds provided by the course reader and additional references. As self-directed inquiries, the research projects required a high degree of active learning and restructuring of knowledge. The students experienced an unforeseen level of connection with the community members, who embraced their efforts and opened their homes to the students. Arguably, this accessibility is due to the unthreatening subjects; students were clearly learning from their experience, rather than 'planning for' as is often the case. Furthermore, the diversity of the interdisciplinary approach allowed the introduction of subjects normally outside of the sphere of academic inquiry; for example, students drew from everyday activities such as salsa dancing, fingernail painting, street vending, sports and local music to inform their studies. These inclusion of these subjects reflect a broader connection by the students to the issues they were addressing as they integrated an interdisciplinary approach. These results evidence a positive implementation of a constructivist approach to pedagogy[9].

After the period of fieldwork, students coded and analyzed their data. The curriculum placed an emphasis on critical inquiry both in the research process as well as in the representation of the gained knowledge. The intent was to foster a mode of work that engages critical thinking in 'critical making'[10] of the final representation. Focusing on the visual translation of data, this form of arts-based research sought to highlight the forms and structures inherent to the information[11] by actively developing the manner of representation of discovered knowledge. Finally, students were required to *reflect* on their work by including an artist's statement to accompany their work in a public presentation, and writing reflective essays on their overall experiences before their return to the United States.

It should also be noted that this process had a profound impact on faculty development. First, it created a greater community of scholars and academics by linking a variety of departments within the university with a common project. Individual faculty members benefited from the discovery of related, applicable knowledge from other disciplines to their own work. The challenge of developing and implementing an interdisciplinary course led to a deliberate and reflective emphasis on the practice of pedagogy, creating meaningful engagement and commitment to teaching. The collaborative applications of multiple disciplinary frameworks to students' directed research projects further enhanced faculty/student relationships, with both sides experiencing learning, and improving communication of theoretical contents via common goals in the applied work[12]. Finally, an elegant complementary symmetry emerged as faculty valued research as design and design as research. This established the parity between the process and product of knowledge building and representation with the process and product of problem solving through design.

Evaluation 1: Interdisciplinary Goals and Outcomes

Having outlined the constructivist framework of the curriculum, we may now turn to a discussion of how the instructional practice accomplished the learning goals of interdisciplinary pedagogy. This will be accomplished by evaluating the course structure outlined above (knowledge building; action; meaning-making; and reflection) against two frameworks drawn from Lattuca, Voight and Fath (2004): the seven goals of interdisciplinary courses; and the four typologies of interdisciplinary learning. This evaluation is important because of the need to distinguish between standards of success and quality in the *course* (teaching and learning) as opposed the more readily visible *project* evidence of the student research work. The question of how to assess quality using communicable standards of judgment is vital to establishing rigorous and accepted scholarship[13]. Two additional possible standards, the impact upon the recipient and the long-term influences on the students, lie beyond our current timeframe, but are worth examining in the future.

The first framework for evaluation contains seven goals of interdisciplinary courses: a) forge connections to students' prior knowledge and experience; b) assist students in developing complex understandings in particular subject areas; c) promote the development of sophisticated views of knowledge and learning; d) influence thinking skills; e) build students' capacity to recognize, evaluate and use differing perspectives; f) engage student interest and increase motivation; and g) enact constructivist and active learning strategies[14]. The goals are applied to the course structure in the order of their introduction. The cyclical nature of knowledge/action/reflection allows for a series of cumulative stages. The first stage, *knowledge building*, introduced disciplinary and interdisciplinary theories and methods in order to a) forge connections to prior knowledge and b) develop complex understandings. As students identified, planned and executed their research work during the *action* phase, they f) engaged their interest and motivation, and e) built their capacity with differing perspectives. In the process of *meaning-making* of their research projects, students utilized g) active learning and d) thinking skills while c) developing sophisticated views of knowledge and learning. The statements and essays of the final *reflection* stage served to reveal the course goals as the students looked back on their project-oriented work. On a personal level, this last phase allowed them to construct new views of themselves as creative individuals in relation to the project, the place and the people.

The second framework for evaluation of course structure as directed to student learning makes visible the intent to have students experience each of the four typologies of interdisciplinary learning: informed disciplinarity; synthetic disciplinarity; transdisciplinarity; and conceptual interdisciplinarity[15]. The *knowledge building* stage introduced an informed disciplinarity as students began to learn about related fields. The *action* phase of research and fieldwork saw students developing a synthetic interdisciplinarity as they drew from multiple sources to inform their research agendas. A level of conceptual interdisciplinarity became evident in the students as they reached the limits of their disciplines and began to critique conventional approaches and boundaries in their quest to address larger issues. Finally, the net total of all of the projects brought students to the transdisciplinarity understanding that community and urban design are best grounded in the idea that good inquiry makes for good outcomes.

Student Research Projects & Evaluation 2: Disciplinary and Interdisciplinary Benefits

The following section provides an overview of the student research projects and groups them according to their application in the discipline of architecture. The categories of application are spatial analysis and community dynamics; visual methodologies; and visual cultures. These projects are then described in terms of their interdisciplinary influences and, if relevant, their contributions to their home disciplines. A discussion of disciplinary benefits alongside interdisciplinary ones is critical: what learning and knowledge are created that are transferable back to the home discipline? In order for interdisciplinary efforts to have reciprocal value, they must serve to not only broaden traditional disciplinary frameworks but also to support traditionally-valued goals[16].

The first category, *spatial analysis and community dynamics*, contains four projects, each of which provide a strong foundation for community and urban design. The most traditional

approach is embodied in a project which studied the attributes of formal and informal public spaces in El Chorillo and the Casco Viejo. This student integrated anthropological fieldwork methodologies which structured in-depth field research. Two other projects came from students majoring in Geography: one deconstructed the dynamics of a popular market street, bringing a physical and spatial perspective to an analysis grounded in political economy; the other project mapped the informal networks of social connections which bind the neighborhood into a lived environment. Both projects linked social dynamics to physical form, grounding the home discipline of Geography, and provide architects with a firmer understanding of the relationship of the built environment to human activity. The fourth project, by an art student, sought to illustrate how space and community is claimed through music. Analyzing the spaces created through the production, enjoyment or enactment of three types of local music, the student presented representations which made concrete the relationship between the physical environment, social gathering and the aural space of sound. This work was strengthened by a gained understanding of the spatial dynamics of architecture and the application of inquiry by design to the final works.

Three projects comprise the second category, *visual methodologies*, which contain research projects that critically examine the process of inquiry and representation. The key contribution of this category is in the development of replicable tools and methods for architectural analysis. Two students developed projects which provided new perspectives on traditional architectural methods. One implemented a series of ethnographic studies using Kevin Lynch's cognitive mapping techniques, only to discover that these methods do not work with people who do not have a developed sense of spatial cognition. The other student developed a highly refined use of the section as a mode of analysis to understand the relationship of the community to the waterfront. This was achieved by taking multiple instances in space and time, coding the results, and collapsing the multiple findings into a single revelatory image diagram. The third student developed a photo survey method based on a four square grid that dynamically relates interview subjects' verbal and pictorial responses to questions about the neighborhood.

The final category, *visual cultures*, foregrounds the material culture of the built environment as a legible text and considers the built environment as a form of public pedagogy. For architects, the ability to 'read the city' by decoding physical traces is a valuable tool for informing design. The three contributions stem from students in the fields of art or art education. One student investigated the production of formal and informal art forms, traced their sources within or outside of the community, and proposed a broader, inclusive definition for what is considered as 'art'. Applied to architecture, this concept allows the inclusion of informal aspects of the built environment to be valued on par with conventional attributes. A second project was oriented to precisely this notion: the photodocumentation of informal residential additions and subsequent considered framing and presentation in a formal gallery served to legitimatize and valorize these examples of informal building. The third project began as an investigative index of the elements and textures which make up the lived environment, and resulted in a series of interpretative collages which accurately embodied the spatial and psychological experience of traversing the neighborhood. For each of these students, the application of architectural understandings of space, the built environment and the relationship with social dynamics enhanced their work within the discipline of art.

Evaluation 3: Structural Characteristics

The preceding sections have shown that the confluence of a well-structured course and an applied project in an interdisciplinary effort contribute to the development of student knowledge and learning. This section presents a number of additional factors that contributed to the particular success of this effort. These factors include: the quality of students; the value of immersion and of direct experience with a problem; the accessibility of interdisciplinary subjects in fieldwork; and the value to students of having a visible application of their efforts.

That good students make for successful pedagogy is well understood. In our case, we benefited from a self-selected group of students willing to take on an extended, in-depth project in a foreign country. This ensured a high level of student engagement and willingness to participate in the experiment of interdisciplinary research. The limits of socialized

disciplinary boundaries became evident when the core group interacted with other students who retained the security of their traditional bounds.

The immersion experience further allowed students to step away from the physical and conceptual bounds of the home disciplines such as departments, buildings and other courses. Working on-site led to a number of challenges, including delays and varying levels of expertise from students outside of their program. In the spirit of the place, however, the students easily took these challenges in stride. The on-site experience also enabled students to have direct experience with the issues and problems they were struggling to address, This made the experience immediate and visceral, rather than an abstract engagement in the classroom. The specificity of the experience greatly enriched the process and product of the student works by grounding them in the detail and accessibility of the environment in which they were working.

As noted above, the accessibility of the subjects of the projects resulting from an interdisciplinary approach to larger issues made the students and their work highly accessible. this was further reinforced by the use of everyday language as the viable vehicle to describe intent and content. Finally, the opportunity for students to directly connect their work to potential positive outcomes in the community energized and legitimized the group. The value of project-based learning in a service-learning framework added greatly to the interdisciplinary inquiry embodied by the course. It also allowed the students to reflect on their capacity to create transferable knowledge rather than simply solve a local problem.

Conclusion: Achieving Interdisciplinarity

This article has provided an accounting and evaluation of a successful experiment in pedagogical and project-based applied interdisciplinarity. Its primary transdisciplinary argument lies in the development of critical perspectives which form the basis for critical inquiry. The ultimate goal of such inquiry is, of course, action and transformation. Much as the four guiding questions about site and site knowledge applied to equally to the course, the project and the discipline of architecture, so can our conclusions. In terms of pedagogy, our experience transformed the process of teaching and learning for both faculty and students, and require the development of a deliberately structured course. For the project in El Chorillo, the application of student work will shift the paradigm from which future development action is to be taken. And finally, it has transformed the notions about methods and values in architecture, particularly in community and urban design, by illustrating the value of critical inquiry as a foundation for good design

The problems of the project were by their nature broader than any particular discipline could address alone. This context led us to question the capacity of any singular ‘silo’ – academic or applied - to solve the problem of course development and project implementation, and to critique normative approaches. In praxis, this led to an awareness that issues are multi-faceted and grounded in a variety of dynamic forces and contexts, some of which are even ‘invisible’. Interdisciplinary approaches to pedagogy and practice lead to breadth and depth of understanding. Likewise, collaborative and multidisciplinary action is required to address root causes and realize sustainable solutions. Finally, specificity gained through the process of inquiry contextualizes and informs general principles.

Applied to the field of architecture, this has several implications: first, the need to further develop critical perspectives on the practice of design; second, a critique of the notion of the objective, expert disciplinary professional; third, an emphasis on the role of design as critical inquiry in both research and as a mode of work; and finally, the application of this inquiry to challenge and restructuring the traditional process of problem solving in community and urban design.

For students, the two sets of interdisciplinary goals set out for the course and the project came together in the context of the place, allowing them a meaningful application for their work, providing an experience of the collaborative and interdisciplinary nature of community-based research, providing them with an opportunity to enact positive change, and crafting a healthy and informed perspective on their roles and capacities to effect such change.

Endnotes

[1] McAvin, Margaret, editor (1991) Landscape Architecture and Critical Inquiry. *Landscape Journal*, 10:2, p. 155-172

[2] Sullivan, Graeme (2005) *Art Practice as Research: Inquiry in the Visual Arts*; London, Sage Publications

[3] Stoeker, Randy (2003). Community-Based Research: From Practice to Theory and Back Again. *Michigan Journal of Community Service Learning*, 9:2, p. 35-46

[4] Heffernan, Kerrissa (2001) Service-Learning in Higher Education. *Journal of Contemporary Water Research and Education, 119, p.2-8*

[5] Burns, Carol J. & Kahn, Andrea (2005) *Site Matters: Design Concepts, Histories and Strategies*; New York: Routledge

[6] Lattuca, Lisa R., Voight, Lois. J. & Fath, Kimberly Q. (2004) Does Interdisciplinarity Promote learning? Theoretical Support and Researchable Questions. *The Review of Higher Education*, 28:1, p. 23-48

[7] Lattuca, Voight & Fath (2004)

[8] Lattuca, Voight & Fath (2004)

[9] Lattuca, Voight & Fath (2004)

[10] McAvin (1991)

[11] Sullivan (2005)

[12] Pribbenow, Dean A. (2005). The Impact of Service-Learning Pedagogy on Faculty Teaching and Learning. *Michigan Journal of Community Service Learning*, 11:2, p. 25-38

[13] Whitehead, Jack & McNiff, Jean (2006) *Action Research Living Theory*; London: Sage Publications

[14] Lattuca, Voight & Fath (2004)

[15] Lattuca, Voight & Fath (2004)

[16] Zlotkowski, Edward (2000) Service-Learning in the Disciplines. *Michigan Journal of Community Service Learning*, Special Issue, Fall 2000; p. 61- 67