

# Integrating Social Science and Design Inquiry Through Interdisciplinary Design Charrettes: An Approach to Participatory Community Problem Solving

Sharon E. Sutton · Susan P. Kemp

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**Abstract** Interdisciplinary collaborations that aim to facilitate meaningful community outcomes require both the right mix of disciplinary knowledge and effective community participation, which together can deepen collective knowledge and the capacity to take action. This article explores three *interdisciplinary design charrettes*, intensive participatory workshops that addressed specific community problems and provided a context for integrating design and social science inquiry with local community knowledge. Evaluation data from the charrettes shed light on how students from the design and social science disciplines experienced the charrettes, and on their interactions with community members. Key advantages to this interdisciplinary, community-based collaboration included expanded knowledge derived from the use of multiple modes of inquiry, particularly the resulting visualization tools that helped community members understand local issues and envision novel solutions. Key drawbacks included difficulties in balancing the two disciplines, the tendency for social scientists to feel out of place on designers' turf, and the increased disciplinary and interpersonal conflicts arising from a more diverse pool of participants.

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S. E. Sutton (✉)  
Department of Architecture and Urban Design, Director of the  
Center for Environment Education and Design Studies (CEEDS),  
University of Washington,  
Seattle, Washington 98195-5720  
e-mail: sesut@u.washington.edu

S. P. Kemp  
School of Social Work, Faculty Affiliate in CEEDS,  
University of Washington,  
Washington

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The whole issue of broadening the disciplines is that everybody can look at the elephant from their perspective, you know, and then you sort of come together on it. And the process works very well if you have both a facilitation process that enables people to understand it from the [experts'] point of view, and you have a facilitation process that really does not presume anything about the [community's] input. . . . because these people are very well-informed (charrette team leader).

The past 30 years have seen a variety of efforts in the academy that aim to improve the quality of life in low-income, minority communities, ranging from long-term partnerships to small projects. These efforts frequently involve collaborations across disciplines and with community members, ideally producing innovative solutions to the complex, and often racialized, problems that exist in these communities. They also bring to the fore the challenges of bridging not only across academic disciplines but also across the social and spatial lines that separate academia from its surroundings. Academics may have difficulty recruiting and interacting with community members as equal partners—especially when they are also attempting to resolve disciplinary differences—and community members may perceive the university as “ivory towerish” and disinterested in embracing the knowledge they have of their own circumstances. Yet, “these people are very well-informed” and essential to implementing any interventions academics may propose.

Interdisciplinary collaborations that aim to facilitate meaningful community outcomes require both the right mix of disciplinary knowledge and effective community

participation, which together can deepen the group's collective knowledge and capacity to take action. In this article, we reflect upon a community participation approach that integrates design and social science within the context of intensive problem-solving workshops called *design charrettes*. Developed by faculty affiliated with an interdisciplinary center of an architecture school, and preceded by a framing seminar, the charrettes resulted in a series of proposed interventions for the communities served. We present three such charrettes (selected for their comparable scope and participants) and their accompanying activities, to illustrate the mutual engagement of designers and social scientists with community members in defining and exploring complex problems. Although conceiving the charrettes required unusual interdisciplinary collaboration among faculty, the article emphasizes the challenges design and social science students encountered during the charrettes as they sought to work across disciplines and with community members. We focus upon students because their developing capacities in interdisciplinary community problem-solving were an important pedagogical focus of the charrettes and therefore we have consistent data on their experiences, collected primarily through a university center that supports and evaluates teaching and learning.

This effort reflects our own disparate but intersecting disciplinary cultures – one author is an artist, architect, and musician (with a PhD in psychology), the other is a social worker (with a PhD in social welfare and a BA in sociology and psychology) – and our shared commitment to finding creative solutions to perplexing community problems. The significance of the methodology we describe is twofold. First, design charrettes offer a promising tool for engaging local residents in community problem solving, while providing them with tangible outcomes. Second, it offers insights into a notion of community research and action, currently rooted in the social sciences, that embraces design as a method of *inquiry*, defined as systematic investigation, on par with widely accepted social science methods.

To provide a framework for describing the varied roles social scientists, designers, and community members assumed during the charrettes, we first explore their distinctive problem-solving approaches. Following a description of the three charrettes, we then surface the differential advantages and drawbacks they posed. We conclude with a discussion of the implications of this methodology for interdisciplinary engagement in community problem-solving.

### Three community problem-solving approaches

Social scientists, designers, and community members approach problem solving in distinctive ways. In partici-

patory community projects, each group's varying objectives, values, and methods produce different outcomes, and result in different advantages and drawbacks. Below we describe each group's community problem-solving approach (summarized in Table 1) giving the most space to design, since this will be unfamiliar ground for many readers.

#### Social scientists' problem-solving approach

##### *Values*

Action researchers' dual obligation to social science and social change begins in the research process with an emphasis upon participation and democratic inclusion (Meyer, 2000). They believe that research should benefit community members either through direct intervention or by laying the groundwork for action (Israel et al., 1998). Typically, action researchers engage in a participatory, iterative cycle of research, co-learning, reflection, and action, expecting that it will serve as a catalyst for structural or cultural change (Boog, 2003).

##### *Objectives*

Social scientists bring to community problem-solving a shared interest in people within their social and material settings. Although some focus upon the immediacy of human experience and behavior, and others are preoccupied with the larger social and material conditions that shape human possibility, all share a concern with people and their social interactions. In action research, which characterizes our work, social scientists are committed to using their knowledge and methods for the social and collective good (Boog, 2003).

##### *Methods*

The differences between action research and mainstream social science have more to do with the researchers' stance, specifically their efforts to realign the balance of power between researchers and end users, than with their choice of methods (Cornwall & Jewkes, 1995). Typically, action research is ecumenical, encompassing both quantitative and interpretive methods, and requires highly developed facilitation skills to manage interpersonal and group processes. It seeks to maximize participation, while producing deeply contextualized data (Luke, 2005) as the basis for critical reflection, dialogue, and the design of appropriate change strategies. Although most action research methods are common in social science research (e.g., observation, interviews, surveys, focus groups, narrative analysis), a hallmark of action research is the use of conventional methods in novel

**Table 1** Three community problem-solving approaches

	Social scientists' approach	Designers' approach	Community members' approach
Objectives	To address complex social and human issues via engaged but rigorous research and analysis	To provide a specific solution that beautifies and responds to functional and symbolic needs	To achieve proactive or reactive goals that reflect their varying backgrounds and motivations
Values	Value solutions that resolve immediate human problems and also generalize to other situations	Value originality and artistic expression that is practical and uplifts the human spirit	Value technical solutions that reflect the complexity of their everyday realities
Methods	Frame problem via theory and prior evidence; use an inquiry mode that involves iterative layering of data; design and test interventions	Co-evolve problem and solution; use an inquiry mode that involves simplification; derive a concept (the big move) that guides future decisions	Utilize the skills of their outside lives; bring relationships, preconceptions, and agendas; lack a normative methodology
Outcomes	Written products with interpretive and numeric data; tested interventions; personal and community change	Visual representations of the spatial environment; enhanced understanding of spatial relationships and potential for change	More aware, capable citizens, more accountable powerbrokers, a heightened sense of ownership, and buy-in to implementing proposals
Advantages	Contextualize local experiences via theory and scientific knowledge; create change strategies that have local buy-in and empirical support	Generate solutions for complex spatial problems; create visual representations that help people understand spatial experiences	Possess socially and politically relevant knowledge that improves decision making and increases the potential for change
Drawbacks	Empiricist, researcher-centric bias hampers participatory, reflexive, and iterative problem-solving	Appear to leap to conclusions; emphasize artistic expression in lieu of social issues, prefer bold concepts over detailed familiarity	Sometimes do not participate, or block problem solving due to disinterest, distrust, personal constraints, or personal agendas

ways or unusual contexts (see e.g., Cornwall & Jewkes, 1995).

When action-oriented social scientists engage in community problem-solving, they bring with them their socialization into the larger culture of social science (Reinharz, 1991). Reflecting its roots in the natural sciences, this culture emphasizes a disciplined, analytic, and scientific approach to inquiry. It prefers careful, incremental testing of hypotheses or interventions derived, as far as possible, from tested theory and empirical evidence, which results in reliable knowledge that applies across situations. As recent scholarship suggests (see e.g., Kloos, 2005), these conventions present advantages and drawbacks to interdisciplinary community problem-solving.

#### *Outcomes*

Action research produces numeric and interpretive data that can inform the problem-solving efforts of community members and others. Often, researchers use these data to tailor tested interventions to meet particular community needs, ideally creating both effective and responsive change strategies for local conditions and experiences. The participatory processes at the core of action research result in changes for the people involved and in targeted community issues.

#### *Advantages*

By definition, social scientists focus upon the peopled aspects of community issues, increasing the likelihood that research will reflect the multilayered complexity of individual and collective experience. Through systematic use of tested methods, social scientists have the capacity to make empirically validated assertions about social and human concerns. By connecting new insights to theory and prior research knowledge, they can locate the complex social problems of everyday life within a broader context. This carefully constructed understanding of social relationships contributes to an informed, critical understanding of particular situations.

#### *Drawbacks*

Because action-oriented social scientists tilt toward the prescriptions and expectations of their larger disciplinary culture (Kloos, 2005), they may continue to frame problems within the academy prior to interacting with community members or use protocols that leave little room for serendipity, intuition, or leaps of faith. Their emphasis on systematic inquiry may frustrate participants who want quick solutions to pressing issues. They may prioritize quantitative methods, which frequently reduce complex problems into measurable variables framed more by theory than by real-world conditions

(Luke, 2005), thus risking explanations and outcomes irrelevant to those conditions. Further, the bias of psychology and other social sciences toward person-centered methods that favor behavioral explanations may obscure the role of contextual and structural factors in community issues (O'Connor, 2001).

### Designers' problem-solving approach

#### Values

Though the term *design* has several meanings, we refer to a method of using visual representations to conceive and plan the features of a spatial environment. As a discipline, design encompasses the inquiry modes of both the arts and the sciences. Design-as-art involves a systematic, though intuitive, investigation of a problem to meet a need or improve an existing condition, while creating something new and preferred at a specific locale (Friedman, 2003; Simons, 1982). Alternatively, design-as-science seeks to make the outcomes of intuitive investigations predictable through an objective analysis of the functioning of varied locales (Simons, 1982). In principle, design is equally an art and a science, in part valuing the subjectivity and specificity of the arts, in part valuing the objectivity and generalizability of the sciences. Yet in reality, factions within the discipline tend to elevate one aspect over the other with some designers asserting that an emphasis upon scientific methods “robs design of its artistic depth” (Friedman, 2003, p. 522) and other designers – far fewer in number – asserting that knowledge-based solutions can better address today's problems than ones emphasizing esthetics. Because of prevailing biases toward design-as-art and because we emphasized this aspect in the charrettes, we use the term *design* to indicate the intuitive, nonverbal inquiry modes employed in the discipline. Design in this sense emphasizes originality and artistic expression. At the same time, a participatory approach to design also seeks to address practical problems in a way that also uplifts the human spirit.

#### Objectives

Design extends human capabilities, ameliorating environmental conditions (Thistlewood, 1990) and giving form to human activity. In attempting to provide a missing element or fix a nonfunctional one, advocates of participatory design aim to not only beautify the environment but to also respond to human needs. The problems they address are typically ambiguous, involving internal contradictions and countless stakeholders. Because brick-and-mortar designs become expensive, permanent features of the landscape – ones not easily replaced if they fall out of favor (Cuff, 1991) – people often resist designers' innovations, preferring in-

stead proven, familiar solutions. For example, residents may reject a design for a branch library that incorporates such energy-saving features as *vertical window fins* (used on the north side of a building to reflect more light inside) or a *flat green roof* (has vegetation to absorb rainwater and slow heat transfer) in favor on a design that mimics the consistent fenestration of a Carnegie-style library or the pitched roofs of their bungalow-style homes.

#### Methods

Designers begin unraveling the messy nature of a problem by drawing from past experience to select and investigate particular elements, and impose a logic that guides subsequent moves (Schön, 1988). They simplify a problem to derive a bold concept (sometimes called *the big move*), looking for surprises and interesting points that will give rise to innovation. Empirical studies of the design process suggest that the problem and its solution co-evolve (Maher et al., 1996), with designers analyzing and coming to understand the problem by trying out possible solutions (Dorst & Cross, 2001). While social scientists would find it foolhardy to attempt interventions before fully understanding a problem, studies have found that testing potential solutions relative to the situation under study is essential to design. Thus successful designers aggressively impose their view of the situation, tackling problem and solution simultaneously (Cross, 2004).

Designing in teams or with community members complicates matters by requiring collective problem solving, which can lead to greater exploration and generation of ideas but also to interpersonal conflicts (Cross & Cross, 1995). When designers work in teams, they must devote part of their time to the group's social processes (Stempfle & Badke-Schaub, 2002); bringing in community members further expands both the need for attending to social processes and the potential for conflicts. While a participatory, team approach can detract from the artistic enterprise, especially since designers lack training in group dynamics, it brings diverse knowledge and skills into the problem-solving process, which can generate more informed solutions.

To access community member's local knowledge and perspectives, designers employ a variety of techniques, including some borrowed from social scientists (Cornwall & Jewkes, 1995). They generally agree that successful community participation requires tools that help non-designers visualize their existing circumstances and assess various future alternatives (Al-Kodmann, 2001; Sanoff, 2000). These tools, referred to as *visualization tools*, can utilize hands-on techniques (e.g., sketching, model-making, mapping, viewing photographs) or hi-tech ones (e.g., Geographic Information Systems, Photoshop, computer-assisted simulations), the latter opening up many possibilities for visually

comparing a community's past, present, and future (Al-Kodmann, 2001).

### Outcomes

The outcome of a participatory design process takes the form of visual representations – typically colorful perspective drawings, diagrams, and models – that help designers study a spatial environment, while also facilitating communication with those persons who will create and use the actual environment (Galle, 1999).

### Advantages

Participatory designers benefit community problem-solving by generating beautiful, functional solutions to complex spatial problems. At the same time, they create visual representations that help people make sense of their spatial experiences and communicate with each other about possible spatial changes.

### Drawbacks

Because designers co-evolve problem and solution, they appear to leap to conclusions, which may lead social scientists and community members alike to perceive them as unresponsive or self-indulgent – a not entirely unreasonable perception since studies indicate that designers have a tendency to make their initial concept work, even when it proves problematic (Cross, 2004). Their emphasis upon artistic expression may also seem irrelevant to pressing community concerns. Further, participatory designers may find that their disciplinary tilt toward bold, novel concepts conflicts with community members' interest in detail and what is familiar to them.

Community members' problem-solving approach

### Values

Knowledge derived from practical experience, sometimes referred to as *personal knowledge*, calls forth a wider range of human perceptions, feelings, and intellectual powers than those associated with *objective knowledge* (Polanyi, 1962). Unlike the objective knowledge of experts, the personal knowledge people have of their communities derives from their experiences in particular places at particular moments in time. People's knowledge is both subjective and spatial, reflecting their experience and understanding of their everyday environment (Tuan, 1977; Waters & Evans, 2003). Because community members have a more nuanced understanding of problems (Cornwall & Jewkes, 1995; Popay & Williams, 1996), they value expert and tech-

nical solutions that reflect the complexity of their everyday realities.

### Objectives

Although many citizens want to participate in decisions that affect the quality of life in their communities (Lappé & DuBois, 1994), others remain disengaged, perhaps due to disinterest in a particular issue, distrust of experts' intentions, or because they have personal constraints, such as long work hours or insufficient funds to hire a babysitter (Cornwall & Jewkes, 1995). Participants have diverse cultural backgrounds and socioeconomic characteristics that not only affect how they perceive their surroundings (see e.g., Nasar, 1998) but also the objectives they bring into a participatory process. Additionally, they have varying motivations for becoming engaged whether as individuals or as representatives of a group. These competing objectives can pose significant obstacles to problem-solving (Al-Kodmann, 2001).

### Methods

Community members primarily communicate their knowledge of a situation by telling stories, and visualization tools can aid the storytelling process. Typically diverse along multiple dimensions (Cornwall & Jewkes, 1995), they assume different roles, drawing upon the skills acquired in their varying personal and professional lives. Community members bring friendships along with animosities, a personal commitment to desirable outcomes along with preconceived notions of what is desirable, and an agenda along with an interest in facilitating some solutions while blocking others (Cornwall & Jewkes, 1995). Some community members follow the generally accepted rules of group dialogue; others disrupt it deliberately or due to lack of experience. Thus unlike social scientists and designers, community members do not bring an agreed-upon methodology into the problem-solving process.

### Outcomes

Potential benefits of community members' participation range from more aware citizens to more accountable power brokers, more community-responsive projects, and a heightened sense of ownership (Israel et al., 1998). Visualization helps diverse stakeholders tell their stories to each other and to the experts, reminding them to point out important historical and current conditions that experts may not recognize (Rappaport, 1999). More importantly, community members' participation helps them build their own capacity to salvage the deteriorated infrastructure of their communities and have an experience of bringing about change.

### Advantages

Because community members bring socially and politically constructed knowledge of the conditions, needs, and attitudes in their communities, they improve the effectiveness of decision making (Israel et al., 1998; Sanoff, 2000). They also increase the potential for social change due to the sense of ownership their participation engenders.

### Drawbacks

For varied reasons, community members may find participation unattractive. Outcomes may seem to offer little direct benefit (Cornwall & Jewkes, 1995) or may seem unrelated to their input. Experts may belittle their ideas or funds may be lacking to implement them. Additionally, the process may exclude the most disempowered people (Sandercock, 1994; Seaver, 1976).

### Interdisciplinary design charrettes

The charrette methodology affords the opportunity to experiment with integrating these different problem-solving approaches within a fixed time frame. Our challenge in evolving the methodology consisted of establishing a spirit of informed creativity, while being even-handed in "looking at the elephant" from each group's perspective. We needed to avoid relying too heavily upon social science inquiry, which would upend the spontaneity of design and result in the designers reacting to community participation as an impediment to artistic expression (Harrison, 1998). Alternatively, we needed to avoid relying too heavily on design inquiry, which would produce uninformed "pretty pictures," or relying too heavily on hi-tech visualization tools, which can falsely persuade (Al-Kodmann, 2001; Owens, 2000) and prevent community members from telling their stories directly. By balancing the contributions of each group, we sought to improve community problem-solving as evidenced by the evaluations and outcomes of each charrette.

A charrette in itself comprises a ritual peculiar to the design disciplines which, according to folklore, began in the 1800s when Parisian students attending the first school of architecture hurried to finish their assignment aboard horse-drawn carts on the way to final reviews. The students drew until the very last moment *on the cart or en charrette* (Kelbaugh, 1997; Sanoff, 2000), sometimes leaping onto the carts to retrieve their presentations from proctors (Kelbaugh, 1997). Today's students use the term to describe the frenetic activity that precedes their reviews, when they dedicate every waking moment to preparing a presentation. Charrettes can also take the form of intensive workshops,

which sometimes involve the public, reflecting a belief that tightly scheduled brainstorming promotes creative consensus building. The most successful charrettes bring factions of a community together to focus mental energy, heighten awareness, and develop consensus on a difficult, timely problem (Sanoff, 2000). In rare instances, charrettes can provide a structure for helping people re-examine fundamental beliefs (Bloom, 2003).

In our university, architecture charrettes had traditionally taken the form of a multi-day investigation of a controversial spatial problem in the city. Nationally distinguished architects, department faculty, and local practitioners served as team leaders and role models for students, doing much of the work and presenting the outcomes in a lecture at the university. Architecture students participated as part of their required course work, with landscape architecture and urban design students sometimes joining in. However because these charrettes were not educational per se, students had a limited role; in most years, about one third lost interest, dropped out, or lacked the skills to keep pace with the work (Kelbaugh, 1997). Though the charrettes accrued enormous successes, the department chair felt the need for a change.

Charged with putting a new face on this revered tradition, the center obtained funding from central administration and began crafting a new interdisciplinary, participatory approach that evolved over time as we reiteratively reflected upon the evaluations of each event. In this section, we discuss the charrette methodology, which required at least one year to realize, including recruiting a community partner, offering a seminar followed by a charrette, and implementing various outcomes. Then we describe three implementations of the methodology.

### Context

The center that sponsored the charrettes formed in 1993 as a traditional inter-academic bridging structure funded by architecture, education, and political science. Its mission included developing design criteria for K-12 school facilities and also creating K-12 design curricula. In 1998, that mission broadened as the center evolved into an informal group of faculty and students from many disciplines who shared an interest in participatory approaches to research and design. As such, our center mirrors national trends in interdisciplinary collaboration, which has evolved over the last century from visible institutional structures into invisible networks of faculty seeking to build bridges between the academy, government, industry, and the community (Klein & Newell, 1998). To develop the charrette methodology and reflect upon its outcomes, faculty and students convened monthly in an invitational seminar.

## Participants

The participants for each seminar/charrette sequence consisted of undergraduate and graduate students, faculty, practitioners, and youth and adult community members. Students included designers from art, architecture, landscape architecture, and urban design; and social scientists from community and environmental planning, education, history, public health, social work, and urban planning. During the charrette, participants formed three or four teams, with each team consisting of two design faculty or practitioners and one social science or design student serving as the leader for a group of 13 to 14 students. For design students, the charrette counted as part of their required core course work; for social science students, it counted as an independent study, which resulted in far lower participation (one or two students per team). To complete their assignment, the teams spent many hours together, with student leaders investing 40 to 55 hours and other students investing 20 to 35 hours over the course of five days, while also attending other classes.

### Expected contributions of designers, social scientists, and community members

We use the term *visual inquiry* to characterize the types of investigative methods we expected designers to contribute (e.g., analyzing topographical maps, creating photographic data banks, drawing) and the term *analytical inquiry* to characterize the types of investigative methods we expected social scientists to contribute (e.g., synthesizing census data, conducting and analyzing interviews, writing). The seminar, which framed the problem addressed during the charrette, required both those methods of inquiry. One task – conducting a needs assessment – helped students turn the vague problem posed by the community partner into a doable assignment for the charrette. It called for interviews with community members, assets mapping, aerial and ground-level photographs, and retrieval of archival data (e.g., maps, census data, historic photographs). The other task – designing a *visioning session* – asked students to create a visualization tool that would help designers and non-designers make decisions together, and then write instructions for using the tool during the charrette. In the seminar, we expected that social science students would take the lead in conducting and analyzing interviews, retrieving archival data, and writing instructions for the visioning session; design students would take the lead in creating photographic data banks and creating the visualization tool; and both groups would map social and spatial resources, and then share their findings with the community partner in order to articulate charrette goals.

The charrettes primarily utilized visual inquiry, each generating about 100 drawings and models. Following procedures typical of a small design office, we envisioned that faculty and practitioner team leaders would assume the role of mentors and project directors, working hands-on with students. The entire team would develop an overall concept, and then small groups of students would explore alternative solutions for aspects of that concept, with the team periodically reconvening to critique and coordinate the small-group designs. While design students would take the lead in producing visual representations, social science students would take the lead in facilitating the visioning session and community forum, and in authoring a mission statement, project descriptions, and script for the forum. Both groups would conduct literature searches related to the social and spatial aspects of the problem.

Community participation consisted of youth developing their own proposals prior to the charrette and presenting them to initiate the event, adults participating in the needs assessment and visioning session, and the public attending a community forum. We expected that the community partner would take the lead in clarifying project goals, recruiting community members with personal knowledge of the problem, organizing the community forum, conducting a tour of the neighborhood and assessing evolving solutions during the charrette, and implementing proposals after the charrette.

### Measures of success

To assess the students and community members' reactions to the charrette, we established objectives reflecting our theoretical stance, i.e., interdisciplinary collaboration, community participation, reflection, and action. To assess these objectives, a doctoral student in education administered a pre-post evaluation; social work students observed two of the charrettes; and a liberal arts undergraduate student, a doctoral student in education, and a doctoral student in social work conducted interviews after those charrettes. Both team members and community members participated in the evaluations (for a complete discussion of the pre-post evaluations, see Sutton & Kemp, 2002; Sutton & Kemp, 2006). The illustrative data from these evaluations comprise one measure of success, shedding light upon the interdisciplinary experiences of students and their interactions with community members. Another measure of success consists of the outcomes occurring after the charrette, including discussions at the center's invitational seminar, reports documenting the proposals, and academic publications by faculty and students. In addition, community partners undertook their own outcomes, beginning with securing participation in the charrette and then using the charrette proposals in a

**Table 2** Participants, proposals, and outcomes for Charrette I

Participants	Proposals	Outcomes
Community partner: suburban school district serving primarily immigrant children	To create informal outdoor learning opportunities at community sites and link them to the schools via pedestrian pathways, students proposed:	A poorly attended community forum Drawings and models
Seminar: 5 design students, 2 social science students with 2 design faculty members and 1 social science faculty member as consultants (10 people)	1. Interpretive trails and signage to make children aware of the history of various landmarks;	A digital publication of the proposals, organized to illustrate outdoor education theories
Teaching team: 1 design student, 1 design faculty member, 2 social science students and 1 social science faculty member (all in education), and 1 student with a background in both disciplines (6 people)	2. A comprehensive bicycle trail to link existing fragmented pathways, while adding bridges, bus shelters, and interactive compasses;	Two public art projects (totaling \$53,500) that the district funded and volunteers built An op-ed piece in a local newspaper and a three-minute spot on a local television station
Charrette: 58 design students, 2 social science students, 8 team leaders, 109 fifth graders, 9 teachers, 3 principals, and 1 district superintendent (190 people)	3. Outdoor classrooms and public art at the three elementary schools; and 4. A habitat corridor to link the yards of private and multi-family housing with the school yards Proposals incorporated sketches by fifth graders	Presentations to school board and city council members New sidewalks leading to one school, though this cannot be directly attributed to the charrette

variety of ways. In some cases, outcomes occurred that we hope resulted from the heightened awareness of a problem that the charrette engendered, but we cannot know this for sure.

### Description of the charrettes

Below we provide a description of each charrette before looking across the three charrettes to synthesize the lessons they provide for interdisciplinary, community-based problem-solving.

#### Charrette I: Improving opportunities for informal outdoor learning in a suburban community

A gateway immigrant community located at the intersection of two interstate highways served as the site for this charrette. With 70 percent of the land zoned commercial, the area had just 15,000 residents compared to 100,000 commuters. The neighborhood afforded a new community center and five new schools, all underwritten by sales tax collections, but sporadic sidewalks, arterial roads, and a steep topography constrained pedestrian movement. Prior to the charrette, a teaching team of faculty and students from our center had been working at two schools where new buildings were being built, providing lessons related to the construction process.

The school district served as community partner, asking us to provide suggestions for improving children's opportunities to navigate and explore the outdoor environment. To complete their task of developing an assignment for the

charrette, the seminar students conducted a needs assessment that included cognitive mapping and design sessions with fifth graders, discussions with teachers, and mapping of the area's outdoor resources. Given analysis of this information, they stated the assignment as: create informal learning opportunities at twelve community sites and link them to the schools via pedestrian pathways. Their visioning session utilized a map locating the sites, along with photographs and descriptions, which teams members were to discuss with children and adults.

The charrette involved 115 participants consisting of mostly white and a few Asian adults and mostly immigrant children. It resulted in a variety of proposals, which the center and community partner continued to collaborate on implementing over a three-year period. See Table 2 for a summary of the participants, proposals, and outcomes.

In their evaluation of Charrette I, students devoted 23 percent of their comments to interdisciplinary collaboration, compared with just 8 percent for community participation. Their comments indicate that would have liked even greater disciplinary diversity and that they believed collaboration generated a diversity of ideas and helped them learn to work together as colleagues. However, their comments also note practical difficulties (e.g., dividing up tasks and developing common ground). Additionally, the comments indicate satisfaction with the opportunity to work with community members on a real-world issue, but dissatisfaction with the lack of input from teachers, who did not live in the area and did not attend the community forum. For their part, the teachers' comments indicate satisfaction with the children's design sessions and university



**Table 3** Participants, proposals, and outcomes for Charrette II

Participants	Proposals	Outcomes
Community partner: volunteer planning group for a middle-income urban community	To meet city-mandated requirements for increased density, while also maintaining its small-town quality, students proposed:	A very well-attended community forum Drawings and models
Seminar: 4 design students with 2 city administrators (designers) as consultants (6 people)	1. Elements to preserve;	A digital publication and an exhibition of the proposals, organized to illustrate six design strategies
Charrette: 51 design students, 4 social science students, 6 team leaders, 12 high school students, 4 young architects, and 15 members of the planning group including residents, business persons, a branch librarian, K-12 principals, and city officials (92 people)	1. Elements to preserve; 2. Multi-story buildings with features that maintain human scale (e.g., overhangs, porches, bay windows, decorative motifs) and offer a mix of residential and commercial use; 3. A streetscape with traffic calming (achieved through distinctive paving patterns and enlarged sidewalks at intersections), a network of alleys, and green streets linking to regional open space; and 4. Refurbishment of the park to include a new stage, curving public art installation with seating, defined paths, enlarged entries, and demolition of an addition to the original field house Park proposal incorporated high school students' ideas	Integration of the drawings into the city's neighborhood design guidelines Two articles in a community newspaper A request for proposals from design consultants that incorporated the digital publication A scholarly paper Codified design guidelines to minimize pedestrian/vehicular conflicts and increase pedestrian-scale architectural features, though this cannot be directly attributed to the charrette

visit as a career awareness exposure, but dissatisfaction with not receiving extra compensation for curriculum planning.

#### Charrette II: Maintaining a small-town character while achieving greater density

A neighborhood of 9,200 persons with residential property surrounding a compact business district and a median household income 30 percent higher than the city's served as the site for this charrette. The neighborhood offered a small-town quality, several historic buildings, an Olmsted park that doubled as a high school playground, and a distinctive natural landscape, but heavy vehicular traffic and numerous parking lots in the heart of the business district diminished its pedestrian quality. Because the city had mandated increased density in the area, a volunteer planning group had organized and created a neighborhood plan.

The volunteer planners served as community partner, asking us to provide drawings that would illustrate their neighborhood plan. In particular, they wanted to influence the city office that would soon produce design guidelines for their plan. Though working within a middle-income context was atypical for our center, we took on this partnership because we felt the charrette outcomes would help inform ongoing debates about density in communities throughout the city.

To develop a charrette assignment, the seminar students conducted a needs assessment that included design sessions with the high school students, meetings with the planners,

and photography. Given analysis of this information, they stated the assignment as: provide alternative approaches to meeting city-mandated requirements for increased density along four blocks of the main street in the business district, while also maintaining its small-town quality. Their visioning session utilized two 50-foot-long photomontages of both sides of the main street; participants were to indicate design preferences by applying cut-outs of various architectural elements to the montage.

The charrette involved 91 participants consisting of mostly white and a few Asian adults and teenagers, even though the university had contributed monies to bring teenagers of color onto campus. It resulted in a variety of proposals, which the center and community partner continued to collaborate on implementing over a fifteen-month period. See Table 3 for a summary of the participants, proposals, and outcomes.

In their evaluation of Charrette II, students devoted fewer comments to interdisciplinary collaboration – 14 percent compared to 24 percent for community participation. Though less relevant in this charrette, many comments about working across disciplines parallel those made by students participating in Charrette I (a broadened outlook on a real world problem that has practical problems in terms of integrating the disciplines), but the comments of this group indicate resentment about lack of respect for the social scientists and the designers' tendency to dominate.

Though the comments of some students indicate dissatisfaction with serving a middle-income community and with

the overbearing style of one community partner, most comments indicate great satisfaction with the quality of community members' input and the sense of purposefulness they lent to the work. Nevertheless, students' comments indicate concern that limited communications with community members and their own lack of familiarity with the neighborhood may have resulted in proposals that did not adequately address local needs. The added attention to community participation in this charrette would seem to reflect community members' increased engagement, which enhanced their perceived value – to solving the problem and to the students' education. However, the relationship also seemed to surface conflicts and result in students feeling less adequate to generate meaningful proposals. For their part, the community partners comments indicate that they had difficulty understanding the charrette process, their roles within that process, and what outcomes to expect. Yet, they rated the charrette very positively and felt it provided them with fundable ideas that “could be immediately incorporated and implemented.”

### Charrette III: Making a historically black neighborhood into a heritage museum

A historically black neighborhood of 28,300 persons (46 percent African American) with a median household income 27 percent lower than the city's served as the site for this charrette. An overcrowded elementary school had served the area during the era of restrictive housing covenants, when Negroes were effectively confined to this area of the city. However, enrollment had plunged and the school closed after the state demolished surrounding properties to construct a highway through the heart of the neighborhood. The school sat vacant for twenty-five years, isolated from its surroundings and symbolizing a bitter struggle by community activists who occupied it for eight years, demanding that the building be converted into a heritage museum. A neighborhood-based agency had just purchased the building and was raising funds to redevelop it into market-rate housing, commercial space, and a small heritage museum. The neighborhood afforded a rich cultural history, numerous churches, several historically significant sites, soul food restaurants, ethnic festivals, and a substantial amount of open space – the result of properties demolished during highway construction – but rapid gentrification threatened to displace the area's historical residents.

The agency served as community partner, asking us to provide suggestions for improving access to their newly acquired building since its original access had been destroyed by re-grading for the highway. They also expressed concern about the neighborhood's acceptance of its plan for a much smaller museum than the activists had envisioned. To develop a charrette assignment, the seminar students conducted a needs assessment that included cognitive mapping, design, and writing sessions with the fifth graders, interviews with

residents, archival research, an inventory of neighborhood resources, and photographic documentation. Given analysis of this information, students stated the assignment as: re-connect the abandoned building to its surroundings, while turning the entire neighborhood, not just the museum, into a display of cultural heritage. Their visioning session utilized images of activities identified during interviews with residents, as illustrated in paintings by black artists; participants were to attach the images to a map to indicate the desired location of these activities.

The charrette involved 94 participants consisting primarily of black team leaders and fifth graders, and mostly white and some Asian students; though primarily white community members participated in the needs assessment and visioning session, many African Americans attended the community forum. This racial make-up and the contested subject matter prompted the community partner to hire an armed guard for the community forum, though this precaution proved unnecessary and insulting to community members. See Table 4 for a summary of the participants, proposals, and outcomes.

In their evaluation of Charrette III, students devoted even fewer comments to interdisciplinary collaboration – 7 percent compared to 59 percent for community participation. Students' comments indicate that they especially valued the charrette's cultural diversity and working with local residents on a meaningful problem, even though they expressed concerns about conflicts between black team leaders and white students, and their own inadequate knowledge of the community. Their comments also indicate satisfaction with the university's involvement in the community and learning about faculty members' track record there, but they also noted the university's general insularity from community issues, and their own lack of responsiveness to community concerns, especially the fear of gentrification. In all, students seemed energized but also overwhelmed by the historical and sociopolitical complexity of the problem. Their attitudes toward interdisciplinary collaboration seemed colored by a strong sense of disciplinary and cultural inadequacy, with racial tensions between students and team leaders adding a layer to the disciplinary conflicts experienced by social scientists and designers participating in previous charrettes. At the same time, students recognized the great benefit of working with community members on a problem of profound social relevance despite the difficulties they encountered.

For their part, community partners' comments indicate a positive reaction to students' tremendous inventiveness and energy, their deep sincerity in trying to address community needs (noting the lack of a “bwana attitude”), the visual documentation of the neighborhood's historic destruction, the unanticipated politeness of the activists, the credibility the university brought to their proposed project, and the charrette itself, which generated innovative ideas and seemed to

**Table 4** Participants, proposals, and outcomes for Charrette III

Participants	Proposals	Outcomes
Community partner: neighborhood-based agency in a historically black urban community	To reconnect an abandoned building to its surroundings, while turning the entire neighborhood into a display of cultural heritage, students proposed:	A reasonably well-attended community forum Drawings and models
Seminar: 9 social science students, 2 design members, 1 design faculty member, and 1 public relations person for the agency serving as consultants (15 people)	1. Gateways to mark main entry points; 2. A network of pathways connecting landmarks and incorporating public art depicting African American and neighborhood history;	An exhibition of proposals organized according to four themes contained in the resident interviews An article in a local newspaper Two scholarly publications
Charrette: 10 social science students, 46 design students, 8 team leaders, 21 fifth graders and 1 teacher, 5 community members, and 3 agency representatives (94 people)	3. Open spaces for social activities (farmers market, pea patches, ethnic festivals); 4. Reopening a street de-mapped during highway construction; reconfiguring a street that floods to drain naturally; 5. Creating a network of businesses and arts organizations; launching a public relations campaign; and getting input from the university's business school Proposals incorporated fifth graders' drawings and stories	A forthcoming doctoral dissertation in social work

change minds. However, their comments noted the need for an ongoing, deeper relationship with the university and the costliness of the proposals.

### Advantages and drawbacks to interdisciplinary community problem solving

We set out to explore a problem-solving methodology that not only integrates intuitive and analytical inquiry but that also engages community participation. A comparative analysis of the charrettes reveals that this methodology offers both advantages and drawbacks to interdisciplinary community problem solving.

#### Advantages

##### *Expanding knowledge through multiple modes of inquiry*

The charrettes provide beneficial insights into how social science and design inquiry can combine to produce a deeper understanding of community problems. The best example occurred during Charrette III, when social science students interviewed community members both before and after the event. While their pre-interviews yielded objective design criteria that provided the basis for the visioning session and for organizing the proposals, their post-interviews deepened our understanding of the benefits of visual representations. These students also spearheaded a systematic investigation

into the history of the neighborhood and school. However, it was through the designers' visualization of the social scientists' research that community members fully grasped the destruction of their neighborhood's infrastructure. Referring to a series of maps showing the neighborhood at different times, one community member explained: "The historic presentation they put together of what's happened here and analyzing it historically is just saying: 'this is what the neighborhood used to be and this is what it is now.' And to see it in that chronological pattern and graphically was very powerful." Due to the interplay between the designers and social scientists, this charrette resulted in proposals that reflected the community's current concerns, as well as its cultural history and evolution. Such interplay did not occur in the first two charrettes because of the dearth of social science students in the seminar.

##### *Engaging community members in the visioning session*

Though we explicitly intended that the visioning sessions would allow community members to communicate on an even keel with team members, in the first two charrettes students were unable to produce an effective visualization tool, despite its evident value. That is, in these charrettes, design students developed a tool with little attention to how participants would use it. The first seminar students traveled throughout the town, documenting sites much as they would at the outset of any design assignment, and then they created an exhibition that community members passively admired. The second seminar students put all their effort into

producing an exquisite photomontage and a collection of hard-to-cut-out architectural elements, which the designers commandeered as community members watched or wrote on the montage. Conversely, the social science students in the third seminar put all their efforts into the process, debating in detail every social interaction that might occur. Though they hit upon a strong idea of using paintings by black artists to depict the activities their interviews had revealed, they lacked the technical skills to produce the visualization tool. In addition, their plan for the session specified many social interactions, leaving little time to work with the tool.

However in a fourth charrette, we finally realized our intentions. We have not reported this charrette here due to its divergence from the others – it involved a more complex problem, many community partners, and a longer time frame. Nevertheless, its visioning session can illustrate what we hoped students would achieve by attending to both the visualization tool and the process of using it. This seminar had five designers and just one social scientist, but two of the designers had a research background. Not only did this group develop the social and visual aspects of the session, they tested their methodology twice, once within the class and again with the community partner, making sure that non-designers felt comfortable manipulating the materials. Their session had four components: socializing over food, teams collaging spatial elements (derived from their needs assessment) onto a map, teams reflecting upon the values implicit in the collage, and the entire group selecting a set of shared values. This session not only generated a compelling shared vision, it created camaraderie among the participants that the other charrettes lacked.

#### *Using visualization tools to engage community members in co-learning*

We intended that the seminar students would not merely collect information but that the research process would help community members make sense of, and communicate, their everyday reality. In this spirit of iterative co-learning, students always engaged K-12 youngsters in hands-on work (drawing, model-making, writing), while discussing their evolving assessment with adult community members. Aerial photographs, intended to facilitate the rapid production of perspective drawings, proved extremely useful in structuring these discussions in all three charrettes. However, the best example occurred in Charrette II when the volunteer planners spent three hours studying aerial photographs of their neighborhood.

After a year debating how to accommodate parking given the city's mandate for increased density, the group had concluded that the numerous parking lots had to remain – an idea that counters expert wisdom on what makes a viable

business district. Pressing the planners to adopt a more innovative approach to parking would have been futile, but the photographs revealed striking evidence of just how much macadam existed in the business district, providing a visual understanding of the issue that differed from their other investigations of traffic counts, number of parking places, and the like. By the end of the meeting, the group had begun to change its position, which further shifted in the coming weeks as they walked the district, seeing the macadam with fresh eyes. By using designers' tools, the group evolved a shared vision that reflected expert wisdom and its own heightened awareness. At the same time, the seminar students emphasized the parking problem in their needs assessment, which encouraged the designers to propose technical solutions the planners had not imagined. That the planners later codified this vision as a design guideline speaks to the durability of the co-learning that occurred.

#### Drawbacks

##### *Achieving disciplinary balance within the seminar*

Unquestionably, the initial problem posed by the community partner determined enrollment in the seminar, which in turn influenced the way students framed the charrette through their needs assessment. In Charrette I, the problem of needing outdoor learning environments primarily attracted design students, but that group expanded to include the social science orientation of the separate teaching team that was involved in the school construction project. While seminar students' framing of the charrette was mainly spatial, the teaching team enhanced interactions with the children and grounded the design process in outdoor education theories. The depth of this interdisciplinary collaboration produced outcomes that continued for over three years, including the design and construction of two separate public art installations by volunteers from the school, university, and professional communities as well as the curricula developed by the center to lead children through these design and construction processes.

In Charrette II, the problem of needing drawings for a neighborhood plan attracted only design students into the seminar, resulting in a sharpened spatial framing of the initial problem, while leaving unexplored its social dimensions (e.g., developing a recruitment approach that might have attracted more teenagers of color). For this reason, Charrette II produced proposals situated within the design literature and utilized by the community partner as design guidelines. In Charrette III, the problem of needing access to a building that had a contentious, racially charged history in combination with needing community support for a contentious plan attracted mostly social science students. This group conducted an investigation into the multilayered historical and

sociopolitical issues within the neighborhood, providing the design teams with a rich, peopled frame for a situation they might otherwise have addressed solely in spatial terms. But the group failed to design a workable visioning session.

Because we were unable to attract a balance of students, sometimes the social dimensions of the problem prevailed; at other times its spatial dimensions prevailed. The disciplinary imbalance of the seminar negated our intentions to pay equal attention to social and spatial issues except in Charrette I, which benefited from affiliation with the teaching team.

### *Feeling out of place on designers' turf*

Despite our intentions to integrate social science into the charrette, this week of frenetic work remained a design enterprise. First, the very idea of students toiling away on a project reflects the culture of design where students spend up to 90 percent of their time in studios that are open twenty-four/seven. Design students are accustomed to investing two or three consecutive all-nighters to produce presentations for midterm and final reviews. Though many design students objected to the disruption the charrettes created in their lives, their education had socialized them to accept such disruption; the social science students, who lacked the socialization and institutional supports, avoided the disruption by limiting their involvement.

Second, team leaders emphasized drawing despite having an assignment that required both drawing and writing, most likely because they had a personal stake in producing visual representations that reflected their skills as designers. Because of this emphasis, the social science students, in a minority on the team, felt obligated to draw; one student even experienced public ridicule at the hands of a team leader for producing crude work. At the same time, neither the design nor social science students completed the writing assignment until Charrette III, when the facilitator became more vociferous in demanding concise descriptions of the projects, which resulted in a community forum presentation that far surpassed previous ones.

Finally, the space and social interactions of the charrette reflected the culture of design. The open atrium where the event took place consisted of work areas separated by easels plastered with visual materials, the design teams working in an atmosphere of perpetual motion at tables piled high with tracing paper, cardboard models, coffee cups, books, and drawing equipment. This studio-like space contrasted with the environments where social science students typically work. In addition, the team interacted by posting drawings and then discussing them, a form of public feedback known as a *critique* in the design disciplines that also contrasted with the private feedback occurring in the social sciences. The distinctive space and social interactions of the charrette contributed to the social scientists feeling out of

place. As one of the center's social science faculty members observed: "I felt like I had arrived late for a party where everyone else knew each other."

### The charrette as a space apart for interdisciplinary community problem solving

Through the charrette, members of an interdisciplinary center sought to develop a problem-solving methodology that would integrate the differing inquiry modes of social scientists and designers, while linking their expert knowledge of social and spatial issues with community members' first-hand understanding of their environment. In this way, we hoped to not only generate a deeper understanding of problems, but to produce useful outcomes for our community partners. The charrettes illustrate that each group of participants contributed something valuable to community problem solving, as did the charrette itself.

Through analytical inquiry methods, the social scientists helped enrich both the designers and the community members' understanding of the historical and sociopolitical conditions that had produced a given spatial environment, while using their superior facilitation skills to manage interpersonal and group processes. Whereas the designers focused more upon the products of the charrette, the social scientists focused more upon the social interactions the charrette engendered. Believing that the visioning process had to consider the people, their culture and history, along with the physical fabric and political climate (Sanoff, 2000), they produced deeply contextualized data (Luke, 2003), using an iterative research process that helped promote co-learning and action (Boog, 2003). Through visual inquiry methods, the designers helped expand the partial view that community members had of their spatial environment and engaged them in speculating about how that environment might develop. Design, which primarily concerns itself not with existing conditions but with how the world ought to be (Lawson, 2002), involves a process of moving things around to create more desirable spatial and visual relationships. By equipping community members with the tools of design, they began to see familiar places with a new clarity and detachment, observing their neighborhood with suspended skepticism, which provided the groundwork for envisioning novel possibilities (Harrison, 1998).

At the same time, community members contributed an understanding of how they experience their social and spatial environment, providing the stories to help the experts interpret layers of meaning that might have eluded them as objective observers (Harrison, 1998; Rappaport, 1999). Community members counterbalanced the simplification/generalization mechanisms that the experts employed with the specificity of their experience. They ensured that neither the designers nor the social scientists would apply the

generic rules they had learned within their disciplines without incorporating the particularities of their neighborhoods. By providing the local knowledge to expand the necessarily incomplete understandings of the social scientists (Scott, 1998), community members assured more nuanced proposals and upended the simplistic, big moves of the designers.

The charrette offered a context for integrating these distinctive contributions to problem solving. A foreshortened *space apart* from participants' normal routines, imbued with the speculative quality of a design studio, the charrette put people into a temporary pressure-cooker with stimulating visual and human resources, and then encouraged them to be co-learners. The charrette methodology promoted a merger of two forms of *technical knowledge* – the visual, subjective, and specific knowledge of designers and the analytical, objective, and generalizable knowledge of social scientists – with the *practical knowledge* of community members. We assumed that the merger of technical and practical knowledge would lead to new insights and possibilities, or *emancipatory knowledge* (see e.g., Bredo & Feinberg, 1982 referring to Habermas; McTaggart, 1991). The charrettes provide some evidence that such transformation did occur. Transformation seemed to occur in normative discipline-based problem solving (“talking across disciplines was easy – too easy, at least at first, but then ‘a new thing’ would and could emerge”), in students' valuing of the community's knowledge (“[we need] to know how to talk to the community and gain insights that we otherwise would not have”), and how the community saw itself (“having a professional team in there . . . really opened up the thought process and allowed us to see the community in a new way”).

In particular, we would note that the visual representations used by designers to explore and frame problems seem to offer a useful problem-solving approach that captures both the generality of social science knowledge and the specificity of local knowledge. In an interview with a social science student, a design student explains:

All of the visual material that the students and the participants generated together is really inspiring to people in the community so that whatever position they come from . . . it was only helpful to see the products that were generated – the drawings and the models and things like that. And it got them excited and sometimes they would see things in them that they wanted to depart from but that was helpful and they even appreciated that. Even seeing something they weren't looking for helped them get closer to what they were looking for.

Yet, the participants also encountered challenges. Expanding from the spatial to include social issues surfaced the rigidity of disciplinary culture. While the designers resisted dedicating some of their time to social processes, the social scientists seemed unduly intimidated by the designers' ag-

gressive spontaneity, each group resistant to rethinking its norms. Every discipline has rules that define competence (e.g., using accepted conventions in a drawing or writing an article in a specified form and style). Nevertheless, interdisciplinary collaboration requires a new set of rules that maintain disciplinary excellence but do not make one discipline an outsider on another discipline's turf. The charrette methodology made the social scientists into outsiders within the realm of design, which limited their capacity to expand the designers' knowledge of the peopled aspects of spatial issues.

When spatial concerns did expand to include social ones, the problem became more deeply contextualized, surfacing greater social differences and therefore greater interpersonal conflicts among the participants. Beginning with a fairly conventional approach to inter-academic relations with community relations as secondary, the charrettes evolved into more engaged but fractious community relations, leaving students feeling unsettled about their disciplinary roles. Interestingly though, many of the features of working across disciplines mentioned in the first two charrettes became more fully articulated as features of working with community members in Charrette III.

An expanded pool of participants – whether across disciplines or within the community – broadens the knowledge base, thus surfacing new understandings and perspectives. By augmenting or questioning accepted disciplinary theories and practices, these new ways of knowing can provide the basis for rethinking issues of power and equity (Schoem et al., 1993), which lie at the heart of the community problems many interdisciplinary efforts seek to address. Perhaps due to the prevailing lack of experience with, or even fear of, difference (Schoem et al., 1993), our experience suggests that greater group diversity results in increased disciplinary and interpersonal conflicts. Yet, we feel that the conflicts represent not a drawback but an opportunity to mediate differing perspectives and envision new academic and social structures. Because a charrette can potentially engage many different participants in speculation, new ways of knowing, consensus building, and mutually respectful relationships across disciplinary and social boundaries, we believe that it provides a useful addition to the tools of interdisciplinary research and action.

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