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Collaboration between architects and planners in an urban design studio: potential for interdisciplinary learning

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Abstract: Design professionals need to acquire competencies in interdisciplinary, collaborative design practice. Proceeding from this assumption, this paper analyses a case study of a joint project between an architecture studio at Bowling Green State University and a planning seminar at the University of Toledo. Students working in extramural teams developed proposals for the revitalisation of a plaza in Toledo, an historic city in Ohio. The plaza, which in architectural terms represents a blend of Gilded-Age finery, high-order contemporary work and stretches of decay, is in the process of slow regeneration. The main goals were: 1) pedagogical - to enhance the students' learning experiences by providing them with the opportunity to work in interdisciplinary teams; and 2) research-orientated - to examine the differences, if any, in design approaches between the architectural and the planning students. Summary outcomes include an enhanced understanding of the architectural-planning differences and a greater appreciation of the potential for mutual learning.

Keywords: architecture pedagogy; collaborative learning; interdisciplinary education; Toledo, Ohio; urban design pedagogy; urban design studio; urban planning pedagogy.

1 Introduction

A rich discussion has developed in recent decades of the need to educate students – including students of design – in the spirit of interdisciplinary collaboration (Klein, 1990, 2005; Johnson and Johnson, 1994; Simpson, 1998). Yet empirical research on how interdisciplinarity enhances student learning has been scarce (Mathison and Freeman, 1997).

In this paper, we contribute to the debate on interdisciplinarity in design education by presenting a studio, which brought together students from two nearby US institutions, one with an architectural and the other with a planning programme. Organised in extra-mural interdisciplinary teams, the students took part in a semester-long introductory urban design course, led by instructors from the two institutions (one architect and one planner), and focused on producing ideas for the revitalisation of an historic plaza.

As co-instructors of the joint course, we had two main interrelated goals.¹ The first was pedagogical: to enhance the students' learning experiences by providing them with an opportunity to conduct interdisciplinary, collaborative urban design work. The second goal was research-orientated: we envisioned the course as a "cultural exchange programme to study one another" (Ward, 2004, p.99). Specifically, informed by the literature on the differences in design style between architects and planners (e.g. Wyatt, 2004) and the literature on the benefits of interdisciplinary collaboration (e.g. Klein, 1990, 2005), we conceptualised the course as an experiment focused on the following research questions: Are there significant differences in design approach between the architectural and the planning students? If so, what can the two groups of students learn from each other through interdisciplinary collaboration?

These questions are significant for pedagogy, since answering them enhances understanding of the specific benefits of interdisciplinary student learning. They are especially important for the pedagogy of design, since they address the crucial role of interactive learning in design studios (e.g. see Ashton, 1998; Wender and Roger, 1995). Furthermore, they are equally important for practice. As Wyatt (2004) argues, despite common wisdom that architecture and planning are closely related, the two fields have developed into separate cultures. By clarifying the differences between the two fields and highlighting the potential for mutual learning, research can provide a basis for mapping out more meaningful ways in which they can collaborate in practice (Wyatt, 2004).

To address the research questions, we use four data sources: the development of the urban design projects of the student teams from the beginning to the end of the

class; the students' verbal reports about their collaborative experiences, which were delivered during formal bi-weekly meetings; the results of a questionnaire distributed among all students after the course; and follow-up in-depth interviews with selected students.

In short, we found that the architectural and the planning students approached the urban design problem differently. Key distinctions included different views on the importance of the relationship between individual buildings and the site, and different ways of initiating the design process – analytically or intuitively. We also found that precisely because of these differences, significant interdisciplinary learning occurred.

Admittedly, the study's conclusions are exploratory, because they are based on a single case involving a small sample of participants from two neighbouring universities. Thus, the findings should serve as a basis for more systematic empirical research.

The paper is divided into several sections. Firstly we outline the main benefits of interdisciplinary collaboration, according to the literature. Then, we review some key differences between architectural and planning approaches to design and discuss the opportunities for interdisciplinary learning. We describe the process and the outcomes of the collaborative studio. At the end, we summarise our findings on the differences between architectural and planning students, and on the process of mutual learning.

2 Benefits of interdisciplinarity

Interdisciplinarity is an approach to knowledge-generation which challenges the more common, disciplinary, approach. The disciplinary method assumes that knowledge must be acquired within the frameworks of the traditional, post-Enlightenment academic fields (e.g. history and sociology; see Nissany, 1995). It purports that meaningful, in-depth knowledge can be only generated via scientific differentiation and specialisation. Interdisciplinarity, in contrast, capitalises on connection-making between the disciplines. In this, interdisciplinarity relates to multidisciplinary (pluradisciplinarity). However, there is a key difference between the two concepts. Multidisciplinary typically refers to knowledge-building, which occurs when problems are addressed through the lens of several disciplines operating in parallel to each other. Results from the disciplinary examinations are then compared and contrasted. Interdisciplinarity takes a step further. It fosters learning between the disciplines and seeks their analytical and methodological integration.² In his book *Why Interdisciplinarity?*, Joseph Kockelmans (1979, p.123) puts it succinctly: "Interdisciplinarity aims at contributing to the restoration of the unity of the sciences and in the long run, of the unity of our world view." In the words of Julie Klein (1990, p.196), "Interdisciplinary is a means of solving problems and answering questions that cannot be satisfactorily addressed using single methods or approaches."

A great inspiration for interdisciplinary collaboration, particularly in pedagogy, is provided in the works of American pragmatist John Dewey. In *The Child and the Curriculum*, (1902/1990, pp.181-182; also Simpson, 1998), Dewey argues that we need to "get away from the meaning of terms that is already fixed", and "see the

conditions [of a dispute] from another point of view, and hence in a fresh light." This requires, he claims, "travail of thought", or to use more contemporary language, the difficult intellectual work to think self-critically, and listen to and learn from others who embrace different points of view. In his later works, Dewey (1916, 1933, 1938) further denounces the traditional separation of the disciplines as a basis for either developing theoretical knowledge or solving practical problems, and stresses the importance of an interactive, interdisciplinary curriculum in which learning occurs via conversation (with texts, peers and teachers), collaboration and constructive conflict (see also Petrie, 1992; Rinehart, 1999; Willis et al., 1993).

Dewey's ideas echo in today's influential constructivist pedagogical approach, which also favours interdisciplinarity. This approach is grounded in the belief that knowledge is not absolute, but socially constructed, and thus cannot be passed 'down' from the expert-instructor to a passive audience of student-recipients (Brown and Digid, 2000; Jonassen, 1991). It espouses the so-called 'student-centred' method over more traditional and hierarchical classroom formats (e.g. the lecture format), and advocates interdisciplinary student-to-student interaction as a means of developing independent and critical thinkers. The benefits of this approach include building mutual respect between students and between students and faculty and, in the long run, fostering greater appreciation of diverse ethical, political, gender and disciplinary views, which in turn prepares students to become more democratically minded and socially aware citizens (Davis, 1995; Magolda, 1992; Muir and Rance, 1995; Newell, 1994). In this paper, we focus exclusively on the process of interdisciplinary student-to-student learning, which occurred in the urban design studio.

3 Disciplinary differences between architects and planners

Both architects and planners are designers. Both are concerned with the arrangement, functionality and appearance of urban spaces. Both conduct urban design projects. In fact, the field of urban design is commonly defined as the intersection of architecture and planning (Inam, 2002; Steger, 2000).³ However, architectural and planning approaches to urban design are likely to be different because the two professions have evolved on separate trajectories through the twentieth century, at least in the USA.⁴ Arguably, the two have developed into separate 'subcultures' (Wyatt, 2004).⁵ The nature of these differences is a vast and complicated topic, and any brief summary will be a gross over-generalisation. Here we review only three basic, but interrelated, professional differences suggested by the literature: differences in design focus, in design decision-making, and in the value placed on the individual versus the collective contribution to design.

..1 Differences in design focus

It is hard to dispute that architects place a stronger emphasis on physical form; they prioritise the visual, the tangible, the aesthetic. Granted, there is a prominent line of architects and architectural pedagogues who have experimented with broadening this focus - from Jean-Nicolas-Louis Durand in the early 1800s (Perez-Gomez, 1983) to

Eriel Saarinen in the 1930s (Garcia, 1993) and Peter Calthorpe today (Calthorpe, 1993). Furthermore, a focus on physical design per se does not preclude a concern with broad social contexts. As the Bauhaus, and the more recent 'socially conscious' and participatory schools of architecture, have shown us, physical design can be employed for progressive social ends (e.g. Hatch, 1984). Still, the traditional focus of architects, even when broader social change is at stake, has continued to be on the creation or transformation of physical form.

This is much less true for planners. Although early planning attempts to solve urban problems in the US were also centred on physical transformation (see Wilson, 1989), by the mid-1900s this focus had dissipated. The possibility of achieving social via physical change was severely criticised in the 1960s (e.g. Gans, 1968; Jacobs, 1961) and a focus on physical form was viewed with disdain (Alonso, 1986; Dalton, 2001).⁶ After the 1960s, planning became dominated by economic and equity concerns. Its methods gravitated decisively toward those of the policy sciences (Alonso, 1986). Of course, most master plans continued to include a physical component and design courses stayed on the core curricula of the best US planning schools. Still, today's planners typically view a focus on physical forms as only one among several other foci, such as economic development or affordable housing policies (e.g. see Levy, 2000).

.2 Differences in design decision-making

Related to the difference in focus is a basic distinction in the decision-making processes of the two professions. Wyatt (2004) puts it succinctly: faced with the same design problem, planners behave more like scientists; architects more like artists. In other words, planners use an "analytical, people-orientated, 'left-brain' approach," while architects embrace a "synoptic, theoretical, 'right-brain' stance." (Wyatt, 2004, p.38).

If we use Schon's (1983) dichotomy of thinking styles, which differentiates between those grounded in "technical rationality" and those grounded in "intuition", or Riding and Cheema's (1991) continuum of styles for processing information and making decisions, which differentiates between the "analytists" and the "wholists" (see Roberts, 2005), then we could conclude that planners gear to the left, while architects to the right. Typically, planners first set clearly formulated goals, then collect 'objective' data and analyse it, following an established 'scientific' model, and reach decisions only after the entire sequence of steps is complete (e.g. Levy, 2000 on comprehensive rational planning).⁷ Architects, in contrast, tend to approach a problem as an integrated whole, less empirically and sequentially, but more intuitively, introspectively and artistically (Lawson, 1997; Roberts, 2005, Wyatt, 2004).

. Differences in views on the value of the individual vs the collective contribution

The last principle difference we discuss here is related to the planners' and architects' views of the role of the individual vs the collaborative in design. To begin with, both professions have a somewhat troubled history of outright individualism. In planning, the early to mid-twentieth century was dominated by the grand masters, who

produced visionary schemes for reform (see Scott, 1998). But the failure of such expert-driven grand designs brought about humility to planning. For about 30 years, the keywords that planning students learned were not 'expert blueprints' but, rather, 'collaboration' and 'public participation'. Today, planners are seldom portrayed as solo experts, but rather as humble public servants, who inform the citizens, learn from them, and help them make their own choices (e.g. Healey, 1997). Not surprisingly, the most valued quality of US planners, as a recent study found, is communication and people-skills (Guzetta and Bolens, 2003).

The evolution in architecture is less unidirectional. Unlike planners, architects cherish artistic creativity (Gutman, 1997; Wyatt, 2004), a concept embedded in the broader idea of the virtue of individual freedom. Statements of legendary arrogance by Frank Lloyd Wright (whose remarks, "A genius said that" referred to himself), Mies van der Rohe (who claimed that lay people have "no capacity to choose," Knox (1988, p.165)) or Le Corbusier (who said that "The design of a city is too important to be left to its citizens", Scott (1998)) are examples of a long tradition which glorifies the heroic artist standing outside of society and leading the way with his/her sharpened sensitivities.⁸ This tradition may explain why architecture's highest honours, the Pritzker Prize, the American Institute of Architects' Gold Medals and the Rome Prize, go to an individual and not a team.

Granted, there is an important counter-tradition of collaborative and participatory architecture, which includes such important names as Ralph Erskine, Lucien Kroll and Christopher Alexander (e.g. see Ellin, 1999; Mikellides, 1980). And, many premier US architecture programmes, such as those at the University of Michigan and the Rochester Polytechnic Institute, are in the process of reshaping their studio cultures to embrace a more interdisciplinary and collaborative means of design-making. Still, evidence of a 'cult' toward the solo architect abounds. The influential Boyer and Mitgang (1996) Report, as well as the recent report of the American Institute of Architecture Students (Koch et al., 2002), pointed to the rugged individualism cultivated in architectural schools as a pressing problem. This view has been echoed by many architectural educators (e.g. Cuff, 1991; Gutman, 1997). The Dean of the University of Minnesota's College of Design recently noted that architectural schools continue to create "star designers" proud to be "free from [the] constraints" of the surrounding social and physical context (Fisher, 2000). The Dean of the University of Michigan's College of Architecture also argued that most architects continue to cherish individual authorship, and students are consistently trained as "solo artists" who use design as a "vehicle for personal exploration and expression". This approach, he noted, leads them to create signature buildings, which do not relate to the surrounding context and even negate it in order to stand out (Kelbaugh, 2004).⁹

.4 Potential for interdisciplinary collaboration between architects and planners

In sum, the literature suggests key disciplinary differences. In conducting the studio, we did not aim to judge which approach is 'right'. Rather, we were interested in how, if at all, these differences affect the students' design process. Would architects focus on physical form more than planners? Would the two groups use different

decision-making? Are planners more open to teamwork? If so, what would each group learn from the other? To use Dewey's words, would students teach each other to see a problem "from another point of view and hence in a fresh light?"

We felt that our students would provide a good case study because they were – until the studio – immersed into curricula dominated by either profession. While in large universities like Harvard, Michigan or Pennsylvania, architecture and planning are part of the same college and interdisciplinary interaction does occur, this was not our case. The Architecture Programme at Bowling Green State University is in the College of Technology. It gives little exposure to social science courses and has no planning offerings. The Planning Programme at the University of Toledo is in the College of Liberal Arts, has a social science focus and no design studios. In the first joint class, we found that each group was unaware of basic professional concepts used by the other: e.g. the planners did not know what a figure-ground study was; the architects did not know what zoning was.

We perceived this lack of 'knowing the other' as a major learning opportunity. By facilitating the cross-mural collaboration, we aimed not only to expose students from one discipline to the logic, language and methods of the other, or merely help them acquire additional skills. Rather, we hoped to force the rethinking of deeply held assumptions of how to define problems and solve them – the type of rethinking, which Dewey identified as the major benefit of interdisciplinary learning. In the paragraphs below, we outline the specifics of our exercise, followed by our observations on the differences between the two groups of students, and our assessment of how interdisciplinary learning occurred.

4 The studio: site, assignment, collaborative organisation and outcomes

4.1 Site

The site of the design project was a once-gracious historic plaza in the City of Toledo (Ohio), a city which is located in the immediate vicinity of both universities. In its current state, the plaza (named the Civic Center Mall) presents many problems in dire need of solutions – problems emblematic of the broader challenges facing the city and its centre.

Once a thriving industrial town, with a rich architectural heritage, Toledo has for several decades been plagued by poverty, unemployment and crime rates that exceed the national averages (poverty rates in 1999 were 18% as compared to 11% nationally and crime rates were 8060 per 100,000 as compared to 3980 nationally (Toledo Crime Statistics and Crime Data, 2004; US Census Bureau, 2000). Downtown has high rates of office vacancies (19% in 2004) (CB Richard Ellis, 2004) and houses just a couple of percent of the city population, which makes it an empty shell of buildings after the close of business hours. Toledo's problems have been worsened by a notorious lack of good leadership and by a lack of cooperation, in planning and otherwise, with the surrounding wealthy suburbs.

The Mall served as a microcosm of the downtown's social and physical shortcomings – from lack of planning and design coherence, to lack of meaningful land-use blend, from lack of economic activity to lack of residential diversity. It encompasses 80 years of visionary, but largely unsuccessful, planning and design

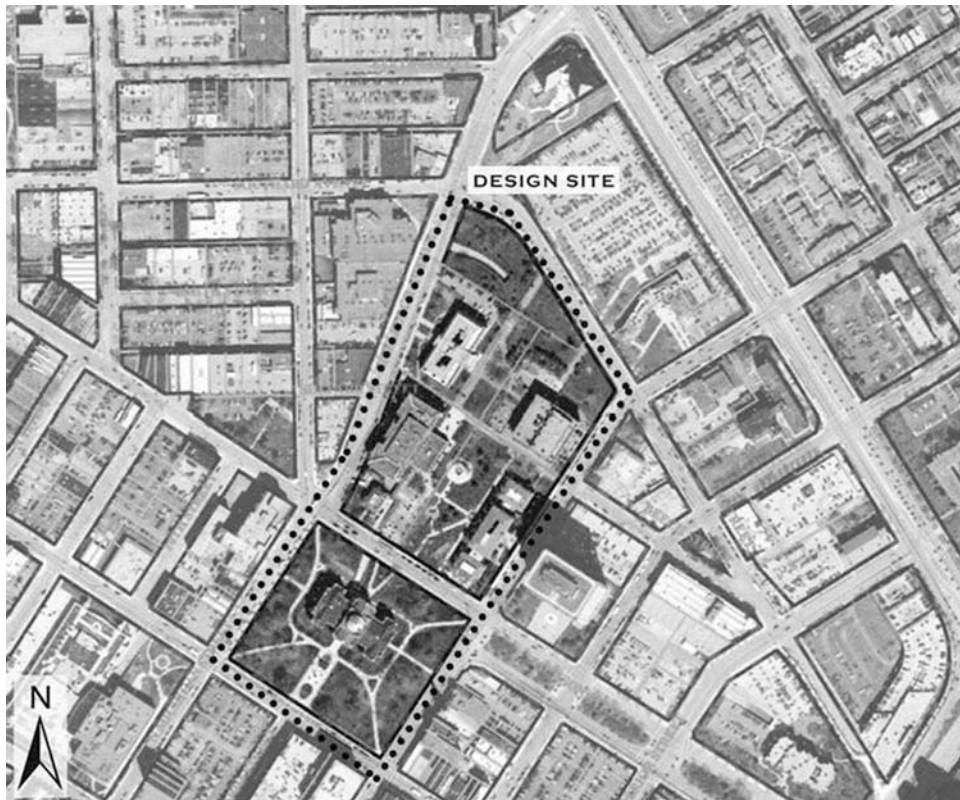
efforts. The first plan, prepared in 1924, was inspired by the City Beautiful Movement.¹⁰ It proposed several buildings in the neoclassical style to frame an open Mall area, with the County Courthouse from 1897 as a terminating focal point. However, of the planned seven, only two buildings were completed. In the mid-1940s, the local newspaper commissioned renowned architect and industrial designer Norman Bel Geddes to create a new plan that would include the Mall. Geddes' (1945) Tomorrow Plan, was based on Le Corbusier's modernist vision. However, it, too, was never realised. Subsequent proposals for the Civic Center Mall (1957, 1968 and 1977) shifted the terminal focus from the Courthouse to a proposed civic auditorium. These plans were also never implemented.

Regardless of the failure of the plans, however, various new buildings were added sporadically over time. Today all of those house civic uses, most having to do with some exercise of punitive public authority (e.g. a court house, a jail and a police station). The additions occurred without much attempt to establish design coherency – something which is clearly visible in the lack of pedestrian connections between the buildings. The heritage of the City Beautiful was offset by rather plain-looking, if not dull, modernist buildings from the 1960s. The buildings do not have much aesthetic or functional relationship to each other, nor do they frame legible space. Located in a downtown with a small population, modest commerce and abundant vacant spaces, and barely connected to its surroundings, the Mall is underused most hours of the day (see Figures 1 and 2).

Figure 1 A figure-ground image of Toledo's downtown reveals its many vacant lots



Figure 2 An aerial photograph of the site



4.2 Assignment

We defined two objectives for the students. The first was outcome-orientated. Working in teams, the students were required to produce urban design proposals addressing the Mall's problems comprehensively. The proposals were expected to transform the Mall into a more vibrant, human-scale, mixed-use and aesthetically coherent place, well connected to its surroundings and fitting the central place it occupies in the history and imagination of Toledo's citizenry. Required outcomes included written statements of vision, goals and strategies; conceptual drawings, scale models and PowerPoint slides.¹¹

The second and more important goal was process-orientated. Students were explicitly told that a collaborative process of design was, itself, a goal of the course and design outcomes must come from intense collaborative teamwork. Grades were to be team-based and reflect both objectives: quality of outcomes and quality of intra-team collaboration.

4. Collaborative organisation

Students were required to work in interdisciplinary teams. There were some challenges to team formation due to class asymmetries beyond our control. Specifically, the two

classes had a different number of students: the architects were 15, the planners only seven. The architects were all undergraduate, albeit all seniors; the planning - a mixture of graduates and undergraduates. This asymmetry was partially balanced by the fact that half of the planning students brought significantly more experience - they were not only graduate students but also practicing professionals.

Ultimately, after some introductory sessions allowing the students to get to know each other, we formed five teams. We allowed the students to build their own teams as they preferred, as long as each team had three to five members. The only explicit requirement was that each team had no less than one, but no more than two, planning members. This eliminated the possibility of having all-architectural or all-planning teams. We further intervened to steer the self-selection process only when it seemed necessary to ensure that groups were heterogeneous, in terms of expected ability (e.g. we did not allow two graduate planning students in the same team). Teams were allowed to find their own manner of communicating and reaching decisions, both inside and outside of the classroom (the latter via e-mail, chatting, telephoning and additional in-person meetings).

The design work was conducted at two locations. Every other week the classes met at a studio space provided by a local non-profit organisation, the Urban Design Center of Toledo, which is close to the Civic Center Mall and the University of Toledo, the home of the planners. During alternate weeks, work continued at Bowling Green State University, the home of the architects (since the University of Toledo has no studio space). Working in two locations created some challenges, but ensured that students from each university spent an approximately equal amount of time in travelling.

To promote teamwork, the studio spaces at both Bowling Green State University and the Urban Design Center were reorganised. The initial arrangement of individual drafting tables - side-by-side, parallel to each other - was not conducive to collaboration. The tables were repositioned in clusters of three to four, to allow for the free flow of ideas between teammates (Davis, 1995) and easy access to other teams and to studio materials.

We designated formal bi-weekly meetings at the Urban Design Center, during which the teams had to present their proposals-in-progress in front of the joint class. The meetings started with the teams arranging their work and clustering around their tables, while the two instructors walked around asking questions and offering comments. Then the teams were invited, one by one, to stand in front of the class with their work and present their visions and strategies. Consistent with our emphasis on collaboration and mutual learning, individual team-members were expected to explain what they had learned from one another. This requirement followed Ashton's (1998) suggestion to encourage students to talk about their learning experiences, rather than to expect them to only present outcomes, which is the traditional approach. After the presentations, the teams took questions and critique from members of the other teams and the instructors.

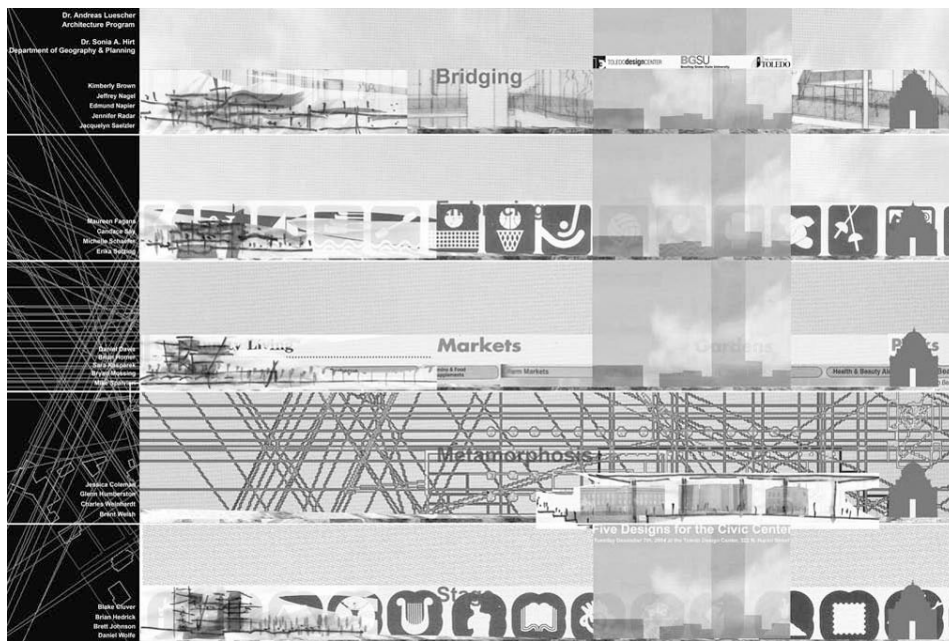
In summary then, we utilised several techniques, which scholars have suggested are conducive to collaborative learning (e.g. see Davis, 1995; Herder et al., 2003). These included team-building, providing teamwork-friendly studio space, making collaboration a requirement, and expecting students to act as teachers and critiques of each other.

4.4 Final work

Final design work was displayed, via multi-media presentations, at the Public Library in Toledo. The forum was open to all citizens. Formal invitations were mailed to all local architects, urban planners at the City and in private practice, and housing and community development groups. At the end, it was estimated that over a hundred people attended the forum.

Five team proposals were presented: Bridging, Embracing the City, Markets, Stage and Metamorphosis. Each included a statement of goals and strategies, drawings, scale models and PowerPoint slides. Presentations lasted 20 minutes each. The teams were free to divide their time as they wished, but all teammates were required to participate in presenting their work. The presentations were followed by questions from the public and a reception. As a finale, we also produced a poster displaying all proposals (see Figure 3).

Figure 3 A poster comprising parts of the urban design proposals of the five teams



5 Observations on the differences in urban design approach and on mutual learning

The findings are based on our notes of how the five proposals developed (including notes taken during the students' verbal statements of how they worked and what they learned from each other); a questionnaire distributed after the class; and discussions with the members of the team, which we believed collaborated most meaningfully and produced a cohesive project. The findings are organised below in five sub-sections.

..1 Differences in design focus

As we expected, the architectural students were strongly focused on physical forms. They started the project by studying the existing forms – via a photographic survey, figure-ground studies, and sketches of existing buildings – and then promptly moving to sketches of potential new structures. In all the teams, these new structures quickly became the proposals' centrepieces. This approach was questioned by some of the planners, who taught that additional analyses – of functions, users and circulation – must be performed before moving on to designing new structures, and who were not sure that new structures were even necessary. This became a source of tension in some teams. For example, one graduate student planner, who took charge of the teams' presentation of an early proposal-in-progress, spoke more about the site and neglected to articulate the details of the proposed significant new structure. This omission produced dismay among his teammates – they were concerned that if the new physical structure was not presented, the class may get the erroneous impression that they were not proposing anything at all. But from the planning point of view, "They [the architects] had their hearts set on creating new buildings from the beginning. As if without a new building, they had no project."

For the architectural students, the new structure embodied their broad vision of urban transformation – a vision which was then exported to all physical elements of the site. For example, if the theme was Embracing the City – ostensibly meaning embracing its history and diversity – the new structure was an arched glass screen that literally 'embraced' (connected) the main existing buildings. The form of the structure itself carried the central vision. It was proposed at the first in-class presentation (see Figure 4). Over time, other 'embracing' elements were integrated in the proposed amphitheatre, the existing facades and the main new site elements (e.g. benches and water features; see Figure 5).

However, this approach, which made physical form the central bearer of meaning, genuinely eluded the planners. As one observed:

"Of course I am used to starting a plan with a vision. But for me vision is something practical like, say, Create Livable Downtown. It is the kind of thing that I can make into a strategy like 'build more housing', but I can't think of a way to put it into actual form. But for them form and vision are one."

.2 Differences in decision-making

One common planning complaint was that the architectural students are 'too quick'. This concern reflected differences in approaching the design problem. For the architectural students, a vision for change came integrally out of the perceived problems of the site, immediately following the first couple of site visits. As one explained,

"I can't remember which of us first mentioned it but I think it was right there after we walked the site. It has such potential and it is so broken down that the Embracing the City idea was kind of an obvious thing. Embracing meant bringing the place together. And once we had it, we began the design work."

Figure 4 Early drawing by the team working on the project Embracing the City. The 'embracing' theme was proposed by an architectural student right after the first site visit. From there on, the 'embracing' screen carried the architectural vision of urban unity. The screen was intersected by a central pedestrian axis uniting another 'embracing' element, the amphitheatre, and the most important historic building on the site, the Courthouse

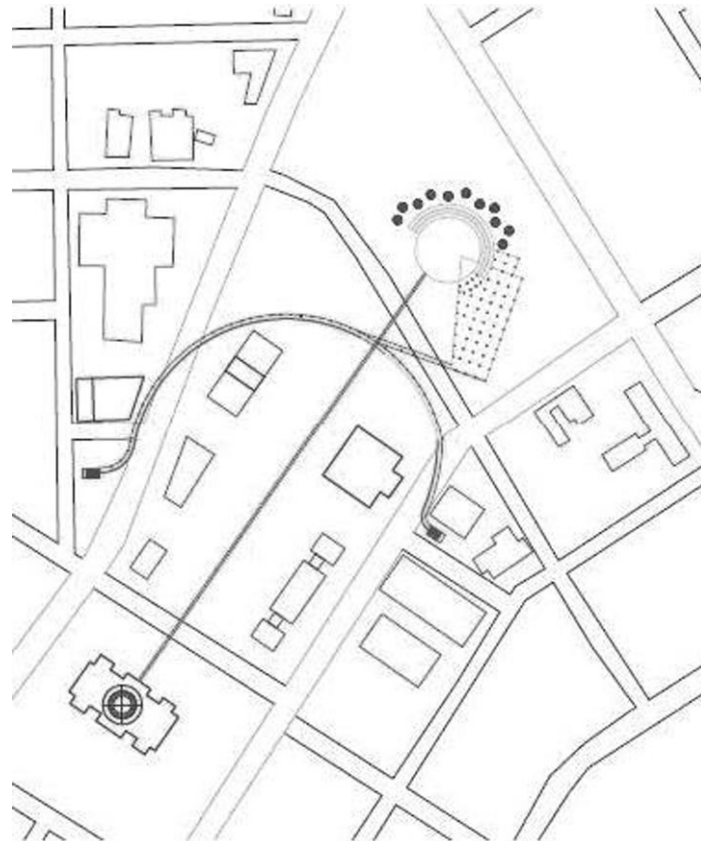


Figure 5 'Embracing' elements were carried on in all other main physical elements, and even in the design of the presentation poster. Notably, the poster showed details of the site design in seven boxes, each representing one of the criteria for good urban design according to William Whyte's *The Social Life of Small Urban Spaces*. Whyte's theory was introduced to the architects by the team's planner. It proved instrumental in that it provided the team with a logical framework, and helped it articulate goals and strategies



But for planners, such a quick movement from problem to solution was foreign:

"They [my teammates] start with sketching and playing with the site. I don't think they first think about it as I am used to – what's the history, what are the functions, who lives and works nearby and who visits. I think I try to follow logical steps from beginning to end. I guess this is engrained with me. They work by immediately modelling the physical solution. I can appreciate their boldness. I apparently don't have it! For me, we hadn't yet figured out what the problem is and they already had the solution!"

. Differences on collaboration

While the literature suggests that architects are less open to collaborative work than planners, we did not observe signs of such a difference and did not receive complaints that any architect was ignoring his or her teammates. It may be that such a difference does exist. Our study, however, was not well designed to capture it, since by emphasising collaboration to begin with, we likely suppressed any student's impulse to display individualistic behaviour. This is a limitation which we address further in the conclusion.

Rather, we observed that the different views on the balance of the individual versus the collaborative role were reflected in the design of the proposed structures – the architects preferred that the new structures stand out as individual signature pieces; the planners wished to make these structures conform to their surroundings. To begin with, in all five teams, the initial buildings proposed by architects stood out by their size – all were larger than the Mall's crown jewel, the Courthouse. In one case, the new building was larger than all existing ones combined. This produced dismay in both instructors and in the planning students. Eventually, all new structures were substantially scaled down.

Disputes also emerged regarding style. Architects were interested in innovation and radical visual contrast between the proposed and the existing; planners in emulation and stylistic cohesiveness. One planner proposed as a project motto a quote from Daniel Burnham's Group Plan for Cleveland (Burnham et al., 1903), in which Burnham eloquently praised unity of style over individuality.¹² The idea was quickly shot down by the teams' architects as too restrictive. The planner also suggested design guidelines, which would ensure that the new buildings echo key stylistic elements of the historic buildings on site. These were eventually accepted in a watered-down version by the team. The planner explained:

"I thought the new building should compliment what is already on the site, maybe not literally but in principle, in some subtle or modified form. And then I suggested using Burnham's quote as a motto. But this idea did not have much appeal for them. They wanted a very large, contemporary building. They thought contrast would work better, strengthen the site more than would consistency. They kept pointing that harmony does not mean same style or similarity, that 'complementing' does not mean 'emulating'. And they used Gehry's Art Museum's addition as an example and said, 'Wouldn't it have been terrible if he just replicated the old museum? No, luckily he complemented it by bringing a new idea. So maybe they are right. Or maybe the truth is in the middle – I guess that's where we ended up!"

.4 Embracing the City: An example of interdisciplinary learning

Below we present the progress of the Embracing the City proposal and some aspects of interdisciplinary learning, which occurred in the process. The team comprised four students: one planner from the University of Toledo, who was a practicing professional, and three senior undergraduate architects from Bowling Green State University.

The architecture students began the project by drawing sketches and creating models and photomontages. As previously noted, their idea of embracing part of the Mall with a glass screen was born early on (see Figure 4). They felt the screen would connect the disjointed fragments of the site and carry a strong symbolic message.

The planning student forced rethinking of the project by introducing theory on what constitutes good urban spaces, which she thought should be discussed, prior to proposing any design solutions. Specifically, she presented her teammates with a summary of recommendations for successful place-making based on William Whyte's book *The Social Life of Small Urban Spaces* (1980). She critiqued the size of the screen and the fact that while it connected some of the buildings, it passed right in front of other buildings, thus dividing rather than embracing the space. She questioned the time spent designing the screen while neglecting simple site problems, such as the lack of seating and a coherent pedestrian trail system. And she demanded that a cohesive written statement of the site's problems be produced, prior to proceeding with design. Eventually, the screen became only one of the project components. Other elements included brief guidelines for future development, a proposal for re-landscaping and re-paving the site, and renderings of how some of the existing facades should be redone. The screen's footprint was redefined so that it no longer divided the space. The screen structure became lighter and was lifted above ground in several places to allow free pedestrian flow. It was also adorned with photos from Toledo's history. The project proposed a new amphitheatre and a mixed-use building opposite the Courthouse, as well as the conversion of some existing buildings to commercial and residential use, in order to create multi-use space. In this team, as in the others, the planner steered the team's attention from the new building to the site. But her key contribution was to aid the architects in developing methods of formal reasoning. Prior to her intervention, the architects were inclined to work from instinct and focus on form-building. By introducing Whyte's criteria for good place-making, the planner brought logical substance to decision-making. She helped the team clarify its goals and develop a framework for evaluating which design ideas may and which may not work. This framework ultimately formed the skeleton of the team's final work and presentation (see Figures 5 and 6). As two of the architects put it:

"I think discussing the book [by William Whyte] and generally talking to her [the planner], was the most helpful thing because it made it possible for us to talk about the things which we wanted to accomplish. We, of course, knew most of these [Whyte's] principles before we started - they are kind of common sense points that should be part of any good urban design - but seeing them on paper brought it all together. It helped the project move along because now we kind of knew more clearly what we are aiming at, what makes sense and what doesn't, and could explain it to others."

"I think before the studio, I was used to being given an assignment; say, 'Design a gymnasium'... But I never came up with the actual assignment. In other words, somebody had already decided that a gymnasium was necessary - so somebody had already given me a solution to a problem (e.g. the problem of not having recreational opportunities) and I had to only refine it. But in the studio, my teammates and I had to actually go through a process of deciding what is needed for the site, so we had to ask ourselves questions and come up for ourselves with what the problems and the solutions are before anything else. And I think she [the planner] had more experience in this."

Figure 6 A detail of the same poster showing site elements, which ostensibly applied two of Whyte's urban design principles: street accessibility and viewability, and sunlight



. Student comments on interdisciplinary collaboration

A questionnaire distributed after class rendered the following results: 16% of the respondents thought the studio was very helpful, and 60% thought it was helpful in developing their interaction skills; 8% rated the interdisciplinary collaboration as excellent, and 68% rated it as very good (see Table 1).

Free written comments also showed that most students appreciated the potential of interdisciplinary collaboration to enhance learning. Representative remarks include:

"The collaboration was a useful forum for exchanging ideas, learning from one another, and helping to prevent a tunnel vision on the part of the architecture and [on the part of] the urban planning students. Much can be learned by cross-training students in this way."

"It's always beneficial for students to collaborate with others, especially outside of their departments and disciplines. I believe this combined experience was worthwhile and with a little tweaking could become a real asset to Toledo, the two universities, and an annual event at the Design Center."

Table 1 Students' evaluation of the learning outcomes from the interdisciplinary studio (based on their responses to select questions from a questionnaire filled in after the class)

Was the experience helpful to you in:	Very helpful	Helpful	Not so helpful	Of no significant value
Developing collaboration/ interaction skills	16%	60%	16%	8%
Developing a critical perspective		60%	32%	8%
Developing public speaking/ presentation skills	16%	52%	8%	24%

How would you rate the experience in terms of:	Excellent	Very good	Good	Inadequate
The quantity of skills gained from interaction	8%	60%	32%	
The quality of skills developed from interaction		68%	32%	
Overall evaluation of interdisciplinary interaction	8%	68%	24%	

6 Conclusions and suggestions for future research in interdisciplinary urban design

The studio pursued two main goals: pedagogical (to enhance students' learning by exposing them to interdisciplinary teamwork) and research (to conduct an experiment on the differences between architects and planners along three key axes: design focus, design decision-making, and views of the individual and the collaborative role in design). As noted above, we encountered a logical difficulty regarding the third axis. We could not effectively judge whether the architects were less inclined to work collaboratively than the planners, since we made collaboration an explicit requirement to begin with. While this is a limitation of the study, we felt that had we treated our students purely as research subjects (had we not required intensive teamwork), we would have failed our pedagogical responsibility. To correct for this deficiency, we suggest that future efforts to measure differences in interdisciplinary studios include surveys and interviews, not only at the end but also at the start of class (i.e. before proceeding with interdisciplinary teamwork).

Putting this limitation aside, the experiment showed that disciplinary differences do exist. Indeed, the architects did place greater emphasis on physical form and approached the problem more intuitively than the planners. They also cherished design pieces which would stand out from the rest of the site – a finding which adds fuel to Kelbaugh's (2004) and Fisher's (2000) views of the high value assigned by architects to 'signature' pieces. Furthermore, the study illustrated that while differences exist, substantial mutual learning may occur via serious interactive

work. To use Dewey's words, we observed that students underwent a process of "questioning of entrenched beliefs and positions," which allowed them to "get away from the meaning of terms that [are] already fixed". The process by which the architects in the Embracing the City team moved, with the aid of the planner, from an intuitive grasp of the situation to a logical framework is a good example.

Given the need for interdisciplinary teamwork in solving complex urban problems (Sebastian, 2003), future research must elaborate on the differences in values, logic and methods between architects and planners, since misunderstanding these differences hampers real-life collaboration (Wyatt, 2004). In order to better document the differences, a future three-semester-long study, for example, could first pose an urban design problem to architecture students, then to planning students, and lastly to interdisciplinary teams. In doing so, such a study will highlight the disciplinary differences in their 'pure form', and will also show how values, logic and methods evolve via interdisciplinary interaction.

Finally, we recommend that US programmes look to enrich their design curricula. Many European schools (e.g. the Eindhoven Institute of Technology) include courses in interdisciplinary and collaborative design. Such courses must enter US schools as well, if the 'great divide' (Wyatt, 2004) between architects and planners is to be ever bridged.

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Notes

- ¹ We also had a third, service-related goal: to serve the needs of the community, namely the City of Toledo.
- ² The differences between multidisciplinary and interdisciplinarity are not firmly set and the terms are often used interchangeably. Other related terms like cross-disciplinarity and trans-disciplinarity are also in play. Cross-disciplinarity usually refers to the examination of the subject of one discipline by the methods of another (e.g. the politics of architecture). Trans-disciplinarity is often presented as the most holistic approach, which transcends the disciplines and builds on their combined insights (Nowotny, 2007). Here, we cannot do justice to this complex debate. Rather, we use the most common term, interdisciplinarity, to imply an approach which crosses disciplinary boundaries and fosters mutual learning and critical thinking.
- ³ Civil engineering, transportation engineering and landscape architecture also relate to urban design.
- ⁴ Our discussion is grounded in our US experiences. Arguably, architecture and planning are better integrated in European and other countries, from Italy to Russia, where the traditional educational background of most planners is in architecture. In the USA, the two professions are quite distinct.
- ⁵ Perhaps surprisingly, scholarly attempts to directly juxtapose the two professions, whether in an historic or a current context, are few. Thus, comparisons must be made by following the two separate literatures – one in architecture and one in planning – as was recently convincingly done by Wyatt (2004).
- ⁶ An example of such disdain is the influential Cleveland Policy Planning Report, which asserted that a plan should not be 'a series of coloured maps' (Cleveland City Planning Commission, 1974, p.2; Hirt, 2005).
- ⁷ Granted, in planning the 'scientific' rational planning model has ostensibly been replaced with the 'consensus-building style', which is more humanistic and people-orientated (Innes, 1996). Under this model, decisions are ostensibly reached not just by analysing 'scientific' data but by direct negotiation of goals and solutions with the citizenry (Healey, 1997, 2003). Still, this does not mean that the planning process has become less sequential or empirical, and thus any closer to the process typically used by architects.
- ⁸ This idea can be well traced in Western thought from Petrarch to the Romantics (Clay, 1981; Curl, 1999).
- ⁹ Kelbaugh (2004) refers to this condition as the "fallacy of mandatory invention".
- ¹⁰ The City Beautiful is the first professional urban planning movement in the USA. Inspired by the mid-19th century rebuilding of Paris and headed by renowned architects and landscape architects such as D. Burnham and F.L. Olmsted, the movement achieved notoriety after the World Exposition in Chicago in 1893. While the main goal of the City Beautiful was aesthetic transformation, its broader aims included developing a stronger

civic spirit and improving public health. The movement favoured neo-classic architecture and left a legacy of civic centres across the USA, such as the one in Toledo (see Wilson, 1989).

¹¹ Since this paper's focus is on the process-orientated goal, we do not discuss the outcomes in great detail.

¹² The quote was: "[A] uniform scale of architecture should be maintained in [the buildings'] design. . . [T]here is no gain but a distinct loss in allowing the use of unrelated styles."