From individual inquiry and attention to cohorts to a "collaborative critique": the use of student groups to support individual designers

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ABSTRACT

This study explores learning settings and strategies related to design collaboration and critical thinking. To this end, theories of education and of cognitive learning were assembled to describe learning design collaboration. Student perceptions of their learning experiences were then gathered in structured interviews and focus groups, and were analyzed qualitatively for concepts, tendencies, and trends. The study also concerns the effects of collaboration on individual learning. An emphasis of the investigation has been on the context in which a person's mind learns. The activity of learning has been enriched by being in a context in which students can participate in the social construction of knowledge, in this way enhancing the processes of developing knowledge, decision-making, and design. We discovered that a "collaborative critique" evolves during the course of activity of groups of students as they shift from the protective behavior of individual competition, through bargaining away ideas in compromise or subduing differences in consensus building, to critical ideation and the constructive behavior of the "collaborative critique".

1 BACKGROUND

The college years for many students are bracketed by collaborative learning experiences which occur in lower grades and in the workplace. Students continue to collaborate in social and athletic activities, but too rarely experience it in learning situations. The report of this research may encourage educators to provide collaborative as well as individual learning experiences throughout the curriculum as preparation for professions and participation in the community of scholars. The same gains may be experienced by educator involvement in the scholarship of teaching and learning (Brookfield 1995).

Research literature has documented many learning benefits from collaborative group projects. Panitz (1999) has constructed a long list of ways in which students benefit academically, socially, and psychologically from collaborative learning experiences. Our premise is that the processes of collaboration also contribute to individual student's learning and development in ways that cannot be achieved in isolation. The underlying premise of collaborative learning is a constructivist

epistemology; knowledge is "constructed, discovered, and transformed by students" (Johnson, Johnson, & Smith 1991, p 1:6) in a social, cooperative context. By creatively rethinking how we conduct our classrooms and studios, by asking students about their learning experiences, and by reflecting on how those experiences impact student learning, we will devise new learning environments, hybrids of old and new models that greatly improve student learning and more effectively prepare them for professional careers.

There seems to be new interest in reflective practice and a willingness to adapt assessment and reward systems to encourage wide-spread participation by educators and staff in the process of jointly creating new learning paradigms. Two seminal works have had an enormous impact on how we frame our thinking about higher education today. Boyer's *Scholarship Reconsidered* (1990) has prompted wide-ranging campus discussions about scholarship and teaching, a new enthusiasm for collaborations between academic affairs and student affairs offices, and restructuring of faculty rewards systems. Astin's deceptively simple student involvement theory has led to learning communities and service learning experiences.

And the explosion in neuroscience discoveries in recent years is adding worlds of new information about how our brains function, confirming many practices that had been based on intuition or experience and forcing us to rethink other assumptions. We are, therefore, on the threshold of developing educational methods that draw on the contributions of many disciplines and that are oriented to facilitating student learning.

This paper is a summary of ways in which collaborative learning experiences contribute to students learning and development and explores ways in which we can incorporate some of the processes of collaborative learning into the experiences of students who are working on individual design projects.

2 COLLABORATIVE DESIGN LEARNING SETTINGS

The authors have synthesized these frameworks and the more recent Boyer/Mitgang (1996) report on architectural education to explore design studio models in order to examine implications for teaching and learning. They have individually and jointly conducted research that explores student and instructor experiences in collaborative design studios, both as they accomplish team designs and as they support individual student designers, examining the ways in which both educators and students develop more thoughtful approaches to scholarship and the ways in which both students and educators become more involved in the process of learning.

3 FOUR INQUIRIES INTO COLLABORATIVE DESIGN

The authors, a professor of architecture and a program assistant in a center for teaching excellence at Iowa State University, draw on their backgrounds in academic teaching, research, outreach, and student and faculty development. They have

individually and jointly conducted research that explores student and educator experiences in collaborative design studios, examining the ways in which both educator and students develop more thoughtful approaches to scholarship and the ways in which both become involved in the process of learning. Four individual and shared explorations are described in this section.

3.1 **Collaborative design studio focus groups**

The collaborative design studios, studied in Findlay's dissertation research in the USA and in the UK, involve students, educators, and practitioners in architecture, landscape architecture, urban design, community and regional planning, and art and design who contract with communities to address specific environmental design problems. By changing the social context in which students learn, from an individual, competitive, setting to one of collaboration in which students and educators and community members work together, boundaries that separate disciplines are blurred. More importantly, however, boundaries that separate research, outreach, and teaching are erased for both educators and students. So "students learn by becoming involved" (Astin 1984) and educators expand their scholarly activities beyond research and publication. Additionally, educators learn to be better scholars by "becoming involved" and students learn more when they participate with some equity in a community of scholars (Bruffee 1984, Kuhn 1977).

3.2 **Interviews with collaborative students**

Four students, from four different majors (architecture, community and regional planning, interior design, and landscape architecture) and who had recently experienced community-based collaborative design work, were selected for individual, structured, in-depth interviews. Ten recurring themes emerged from the transcripts of these interviews:

- addressing the dual expectations of the community and educator,
- needing to educate community clients about design,
- broadening students' concept of design,
- designing in the context of a complex decision-making process,
- learning by doing,
- differing interests of community and educators,
- understanding the value of teamwork,
- confirming career aspirations,
- gaining self-confidence, and
- gaining a sense of worthiness of effort (Haugen & Findlay 1996).

3.3 **End-of-term formative evaluations of learning in community**

Student course evaluations are often a touchy subject among educators but that is due in large part because they do not devise their own assessment methods. Educators are often obligated to use standardized evaluation forms, but that does not prevent them

from supplementing them with means that are more directly related to their specific learning situation. Duffy and Jones (1995) suggest that the syllabus be used as an evaluation tool, asking students whether the course fulfilled the stated goals and objectives for the term. In this on-going study of the effects of group activity on individual learners, in place of the section usually allocated to open comments on the standard evaluation form, students are prompted, by a few questions, to describe their perceptions of the learning experience. The questions are about the learning task of content or skills; the socio-physical setting; and the learning strategies (Sternberg and Wagner 1994) as they were outlined in the course syllabus. A record of such inquiries and course adjustments, as scholarship of teaching, could be a major component of a teaching portfolio. The key is that *students are willing and articulate informants in this activity when they are asked questions specific to their learning experience*. We have found this to be true in each of these studies. Furthermore, students are far more likely to remember and develop a deeper understanding of what they have learned when they are asked to engage in metacognition, the process of thinking about their own learning experiences (Johnson, Johnson, & Smith 1991).

3.4 **Collaboration in support of individual design students**

In this study, and in contrast to the single product of collaborative design work described above, teams were formed in order to support students in accomplishing individual Senior Projects. The question was "would students reach the same level of attention, responsibility, and respect for each other's critique - not of a joint project, but of each individual's project - and perceive that there is value when they help each individual to succeed?" The learning context for this study was described through structured interviews with several educators who had recently facilitated these studio sections. A semester-long schedule was structured with student-requested individual critiques with the instructor during the week; a Friday group session based on a progression of tasks from project definition, through ideation to presentation; and third-term external reviews involving other educators and practitioners. In addition, a variety of critique settings were utilized.

Student perceptions of these learning conditions were prompted via informal contacts, electronic mail inquiries, and an end-of-term focus group. Their comments were informative, “I enjoy having practitioners in the review panel if they contribute to the discussion; I have had several on reviews that have contributed little to no criticism at all. When the practitioners open up they can offer an interesting point of view. Educators, on the other hand, are used to the process and can always produce valuable criticism. As we saw on Monday, however, that can become a destructive process making no progress at all, and progress is absolutely critical at interim crits.”

“I feel more comfortable sitting around a table discussing a project. It seems to foster a conversation rather than a presentation followed by intense questioning. I feel that as a student, we feel more comfortable proffering our views on another’s project in this setting. We should be able to glean ideas from faculty, students, and practitioners. It is a unique opportunity that the academic environment provides.”

An electronic response from another student is in contrast, “As for the review style from last week, I always tend to be more at ease when it is a roundtable discussion. It may have to do with presentation nerves, but I feel that both of them are appropriate. I may be more nervous when I present but I still walk away with the same amount of feedback, if not more, than in the roundtable format”.

From a third student, “I was more comfortable during the roundtable review which enabled me to present my project more convincingly. Why was I more comfortable? I guess it was because we were on a more intimate level. We were eye to eye, and it was easy for everyone to have a voice in the discussion as well as an interest. I was able to take notes on their comments and it felt as if we were there to help each other with each other’s projects”.

This student provides a view of the more frequently used stand up presentations. “The second review is more like a crucifixion before the masses. Okay, maybe I am being a little dramatic, and I know that my last review went well, but from past experiences, those images seem to flood the mind. In this type of presentation, we get up in front of the critics and our classmates, we express our ideas and our beliefs before them, and then we are critiqued, or should I say stoned, by the panel. It seems to be a one way conversation with little opportunity for our fellow students to take part or have an interest. Take our classmate, for instance, who after his review asked me, “”was my presentation as bad as I thought it was?”” That was his concern. He didn’t ask, “”How do you think I could make it better?”” or “”How could have I been more articulate with my ideas?”” No, he just asked, “”Did I get crucified?”” How is that helping him? It is not. For myself, I had to kneel at the table and take notes, which seemed to put the review panel off, but I wanted and needed to record an outside perspective.” He concluded his electronic message with “there is also a conditioning effect, which transpires over the years from this type of presentation. We are conditioned to expect a negative response to our thoughts and ideas. We dread the whole process and find it hard to focus because of our previous baggage. While both types of review may be useful, the roundtable review is by far more productive for everyone in every way”.

Their on-going learning assessment of the semester confirmed that they reached an effective level of collaborative critique in support of each other, and it was of considerable value in adjusting future offerings of this capstone studio. The diversity of responses also reminds us that they are at different developmental levels and that they have different capacities and experiences on which to draw.

4 FROM INDIVIDUAL INQUIRY AND ATTENTION TO COHORTS, TO A "COLLABORATIVE CRITIQUE"

We have discovered that a "collaborative critique" (Findlay, 1996) evolves *during the course of activity of groups of students as they shift from the protective behavior of individual competition, through bargaining away ideas in compromise or subduing differences in consensus building, to critical ideation and the constructive behavior of the collaborative critique.*

Once engaged, students enter a negotiation phase that is initially seen as compromise, giving something up in the bargaining in order to have something incorporated in a design proposal. With some experience in group work, the conversation changes again. They report discovering similarity and common concerns among individual efforts. What students refer to as brainstorming turns out not to be evaluation-free, but an exercise of active critical ideation where ideas are generated and immediately evaluated as to suitability and consistency with project objectives. It is in this activity that students pay critical attention to the work of team members and see value in the response of others to their work. Sagacity is at work as they seek opportunities for their ideas in the group effort, be it the team project or their individual work. Students find increasing value in the work of cohorts, and they shift from looking for competitive advantage to the critical tempering of shared and individual ideas.

These shifts in cognitive behavior have been described as the heart of the educative process (Ausebel 1977, Mezirow 1990). If one accepts the premise that education changes people, then we ought to be cognizant of that impact and strive to ensure that students are changed in positive ways. Collaborative learning processes reflect a personal philosophy, not just a classroom technique (Panitz 1997). A fundamental tenet of a collaborative philosophy is the benefit to groups that is derived from a democratic, non-competitive approach to problem solving and learning. Students are expected to help decide what they will learn, how they will undertake their learning tasks, and how they will demonstrate their proficiency (Johnson & Johnson 1990, Knowles 1984). Through collaboration, students learn how to function more successfully within professional teams and how to be more effective citizens of their communities.

This is not only a strategy to improve learning, but a deliberate effort to help students achieve higher levels of cognitive development. Perry (1977) described developmental levels of traditional-age college students as moving from a dualistic perspective with heavy reliance on higher authority, through an acceptance of ambiguity, and finally to an ability to make choices based on individual values and beliefs that have been critically examined. Bloom's (1956) taxonomy of educational objectives, which describes how students move from simple knowledge to a critical evaluation of information, is at work here as well. Bruffee (1995), in describing characteristics of collaborative learning, emphasizes its utility in developing nonfoundational knowledge, which he says, is more likely to address questions with dubious or ambiguous answers, answers that require well-developed judgment to arrive at, judgment that learning to answer such a question tends, in turn to develop" (p 15). In Perry's terms, collaborative learning helps students move from dualism, through comfort with a multiplicity of conditions, to contextual relativism. We come to see design propositions, like knowledge, as constructed rather than discovered, as contextual and based inevitably on approximations.

Properly constructed and managed, collaborative learning experiences provide the social support needed to make those changes emotionally acceptable (Cohen & Willis 1985). Brain-based research suggests that the emotions play a much greater part in learning than was previously supposed. The limbic system of the brain, which controls automatic body functions as well as emotion, is the filter through which the

brain determines whether to pay attention and retain information or to discard or ignore it. Our emotions drive our attention, health, learning, meaning, and memory (Jensen 1996). In this safe and supportive environment, students begin to pay attention to the work of others and sagacity is at work as they see value and opportunity in the work of others and in other's comments regarding their own work. Nystrand (1986) found that when students critique each other's written assignments, they tend to view subsequent revisions as a substantive rethinking of their work, whereas "students who did not work in groups viewed the task as editing only" (p. 19). And the need to explain their thinking processes, how they arrived at a decision, the steps taken in developing a solution, all contribute to students' metacognition, the ability to recognize, reflect upon, and monitor one's own thinking and decision-making (Johnson & Johnson 1992).

The business management and education literature are replete with discussions of how to motivate people. While all sources seem to agree that intrinsic motivation is far superior to extrinsic motivation for long-term results, very little has been written about how to promote intrinsic motivation. Wlodkowski (1999) notes that intrinsic motivation develops attitude, establishes inclusion, engenders competence, and enhances meaning within diverse students. Alfie Kohn (Vogl 1994) asserts that no one can motivate another person, and that all extrinsic motivation is manipulative, even tangible rewards and verbal praise. On the one hand, we usually can tell when someone is simply using us as an example to admonish others to do better. And tangible rewards tend to build an expectation such that if we do not receive them or receive less than we expected, our perception is that we are being punished. Kohn suggests that intrinsic motivation doesn't have to be created but that one can create conditions in which it is more likely to develop and flourish. He recommends that people be given a maximum amount of choice in contributing to how decisions are made, that they be engaged in meaningful work, and that collaboration contributes to intrinsic motivation because it produces better work as well as a "climate of support and community" (p 44). Intrinsic motivation is enhanced when one's contributions are taken seriously and contribute to the group's success.

Research into the processes and outcomes of collaborative learning experiences contributes a number of explanations for these findings. Collaborative learning helps students to develop their self esteem (Johnson & Johnson 1989) and self management skills (Resnick 1987); students, in helping each other, build a supportive community which encourages higher levels of performance (Kagan 1986), fosters appreciation for diversity (Burnstein & McRae 1962), helps to develop the leadership skills of female students while helping male students become accustomed to seeking help from females (Bean 1995), and promotes a team approach to problem-solving while maintaining individual accountability (Johnson, Johnson, & Holubec1984); students learn to critique ideas, not people (Johnson, Johnson, & Holubec 1984); and students wean themselves away from considering educators as sole sources of knowledge and understanding (Nelson 1994), thus developing their critical thinking skills.

Collaborative learning experiences are a primary contributor to the socialization of students into the language and culture of the design disciplines.

Bruffee (1995) contends that all people belong to several "interpretative or knowledge communities" which share language, perspectives, histories, values, conventions, and interests. Through collaborative work, students become familiar with and conversant in the language, concepts, and values of the disciplinary culture.

Our on-going study of learning in community is demonstrating that studio learning experiences can be designed so that they incorporate the positive outcomes of collaboration even when students are working on individual projects. Through frequent opportunities for meeting to talk about their work, offer each other constructive feedback, and develop a supportive community, students are engaged in collaborative activities that help them to:

- work more productively in teams;
- develop critical thinking skills;
- unleash their resources of intrinsic motivation;
- develop healthy self esteem;
- produce better work;
- critique ideas without making personal attacks;
- take responsibility for their own learning and performance; and
- participate knowledgeably in the intellectual exchanges of architecture professionals.

An admonition: It is not easy to establish collaborative work - groups still need to form, storm, and norm before they can perform (Tuckman and Jensen 1977). Also, faculty have to learn to let go, as a sense of responsibility shifts from the educator's authority to team cohorts and the project(s). Educators must develop a comfort level, an expertise, that permits risk taking, Perhaps most important is for educators to share authority and control over all aspects of the management of learning that is associated with andragogy (Knowles 1984, Panitz 1997).

5 CONCLUSIONS

The primary motivation for this exploration into learning is the conviction that collaborative activity is a precursor to professional practice in environmental design - where individually directed design is rarely accomplished independently. Extending this idea, the Boyer/Mitgang (1996) report on architectural education recommended that the project-based design studio model, especially when it is a collaborative environment, is a model worth adopting in other university disciplines, however contrary it may be to many university conflicting demands for higher student-instructor efficiencies and the statistical assessment of student outcomes.

Vincent Tinto suggests that to improve higher education, “If universities were serious about enhancing student learning, we would explore other ways of organizing our work. Among several possibilities, three spring immediately to mind: First, we should reorganize our curriculum into learning communities which enable student learning to span disciplines. Second, we should reorganize our classrooms to promote collaborative learning experiences within the classroom so that students learn together rather than apart. Third, we should employ forms of classroom assessment that

encourage students to engage in a shared discourse with us about their learning and provide them immediate information that they can use to improve their learning." (Tinto 1997)

Higher education is very slow to accept change but the world around us is accelerating the rate at which it redefines the skills and experiences that people will need to participate. The authors are involved in, and advocates of, initiatives on their campus that have the potential to make long-term changes in the ways in which university education is conducted.

Much of this research was accomplished with the support of a multi-college research Project LEA/RN™ (Learning Enhancement Action /Resource Network) group and a Miller Faculty Fellowship, both of which are faculty development opportunities at Iowa State University for educator learning-in-community. The several members of this group undertook assessments of some aspect of their teaching and learning strategies in engineering; veterinary medicine; liberal, consumer, and military sciences; education; communications; and design. The group of educators met bi-weekly for over a year to mutually critique their methods and outcomes, finding richness both in their common developmental needs for students and educators and in the pluralism of their learning settings and strategies.

Students perceived that individual creativity in form-making is enhanced by the tempering it receives in a collaborative situation, whether they are contributing to a team project or being supported while working individually. A truly collaborative group, one that does not suffer from lingering competitiveness, recognizes individual excellence among its members and their ideas. If educators do not reward some students at a cost to others, as happens in competitive studios, but reward the contributions of individuals to the group effort, without quota, the creative atmosphere in the studio can flourish. The learning environment is broadened to include other players, with whom students learn how and for whom they are designing; enjoying architecture as a social and cultural activity.

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