The Future of Interdisciplinary Collaboration Through the Use of Technology

Chris Birchak
Jean DeWitt
Herb Rebhun
University of Houston-Downtown
Houston, TX 77002 United States

Abstract

Computer-mediated collaboration enables students to create learning communities across disciplines, fostering interactions of cognitive and social complexity. For the past five years, we three professors have designed and conducted a series of team projects involving students in upper-level English, speech, and business computer courses. All interaction occurs online, providing students in our multicultural, urban university and in our off-site locations with expertise in communicating with technology. They participate in project planning, exchanging and critiquing drafts of PowerPoint slides, conducting a workshop through the use of ITV, and producing HTML documents using FrontPage or Dreamweaver. In our paper we discuss strategies for implementing these interdisciplinary endeavors that encourage students to create their own knowledge collaboratively. In recent years, our cross-functional team projects reflect an awareness of computer-mediated learning environments and the need to develop the students' ability to work effectively in teams in order to succeed in a competitive, global economy.

Keywords: Cross-disciplinary collaboration, computer-mediated communication, experiential learning, teams

Using technology to stretch across distance and time enables students to develop team building skills that mirror real life challenges: deadlines, group cohesion, communication difficulties, and interpersonal conflicts. A project that requires specific expertise from multiple persons necessitates collaboration across disciplines. For five years, we three colleagues have designed and implemented cross-functional multimedia collaborations among our classes in business, English, and speech. For each project, the focus remains team building aided by technology. Effectively communicating with technology is an essential life skill.

In order to make the learning meaningful, we select workplace issues, encourage teams to appreciate multiple viewpoints and to make choices that enhance a learning community, and incorporate assessment procedures that foster self-reflection. In addition to enhancing the curriculum with collaborative learning projects, we professors across these disciplines benefited from our own teamwork to coordinate the assignment. Working together we served as role models for our students and gained knowledge of each other's expertise. Therefore, both students and professors are enriched from cross-disciplinary collaboration.

The University of Houston-Downtown (UHD), set in the midst of a metropolitan area, has achieved national recognition for its diversity. The average age of our approximately 10,000 commuter students is 26.5. The participants in our collaborative projects continue to reflect the ethnic diversity characteristic of the UHD students: 30% Hispanic; 27% Caucasian, 27% Black, 12% Asian, and 3% International. This rich environment fosters a creative spirit and provides a multicultural context for learning communities.

BACKGROUND

When we began our first interdisciplinary collaboration five years ago, we did not realize how these interactions would evolve, continuing to be incorporated into the curriculum when we see a pedagogical advantage. Thus, depending upon the classes we three professors are teaching in a given semester, we decide whether any technological initiative seems warranted. Occasionally, two of us will establish a project involving our classes. For instance, one such collaboration between the business and English classes resulted in student-developed presentations on specific diseases, including malaria, hantavirus, and dengue fever. The students in medical writing, an interdisciplinary class itself, selected diseases for their research reports, ultimately adapting these into PowerPoint slides enhanced and expanded by the students in a computer graphics course in business. In

other semesters, the speech and the writing classes engaged in shared activities resulting, for instance, in a technological presentation evolving from recommendation reports for targeted audiences. Typically, the focus for the collaboration arises from writing and research assignments in classes taught by the English professor. Part of the degree program in professional writing and often including majors from the natural and social sciences, these classes are taught in a computer lab. Technology, therefore, becomes an integral part of the curriculum.

Throughout the years we have focused on the learning objectives of our different courses, ensuring that the collaborative project enhances the students' credentials, strengthens their ability to work in teams, and expands their technological expertise. For our first initiative in fall 1997, students in a junior computer graphics course in business and in an upper-level English course used HyperStudio to create a CD-ROM prototype entitled "Gulliver in Cyberspace." We selected this software at the suggestion of our instructional technologist. Involving a short learning curve, it allowed students to focus on course material while developing interactive multimedia. Unfortunately, we found HyperStudio to be unstable, particularly as the projects incorporated more sophisticated levels of animation. Students, therefore, experienced both the wonders and the traumas of working with innovative technology. Interestingly, the two classes developed excellent rapport as they struggled with software challenges.

Our colleague in speech communication joined us the following semester as students researched and created a PowerPoint presentation entitled *Room to Room: Illuminating Reality.* Each team explored narrative traditions of space and time in one of three works: *Gulliver's Travels*, *Jane Eyre*, and *To the Lighthouse*. It traced narrative traditions of space and time, exploring the extent to which authors portray rooms as felicitous space or confining prisons. Although PowerPoint did not afford the programming options of HyperStudio, it offered stability, a criterion for future projects. The greatest challenge in these days before collaboration had become a standard in the classroom was convincing students from these different disciplines of the value of shared learning. Although initially the English novel and PowerPoint seemed an unlikely combination, students expanded their confidence by transforming cultural data into "rooms" of information.

In more recent years, the collaborative projects have reflected our growing interest in different delivery systems and in course management software. In spring 1999 students in our three classes created multimedia presentations on issues arising from the Y2K problem. We used course-management software for communicating inasmuch as one class was delivered through ITV, one was located at an off-site location, and one was face-to-face at our urban site. The bulletin board function in WebCT, our university-approved software, allowed team members from the different classes to exchange comments, plan the project, and post drafts. Brainstorming our next initiative, we decided to incorporate a real-world element, resulting in a product to be delivered to a targeted audience. In fall 2001, Computer Graphics in Business, Business and Professional Speech Communication, and Writing for Presentation created and produced a workshop for excelling on standardized tests such as the GRE, GMAT, and LSAT. Using ITV technology, the workshop was delivered at two sites on a weekend, providing students with the challenge of presenting material to a live audience in a synchronous environment. Ultimately, the material was expanded and converted into web format using Dreamweaver.

At the beginning of the semester, students in the English class brainstormed key concepts essential for the workshop, researching print and digital resource. Then, they identified seven teams essential to the success of the project. Most of these focused on strategies for succeeding on specific sections of the graduate entrance exams; however, others targeted testing procedures, learning styles, and the LSAT. A publicity and logistics team coordinated the collaborative. All participants were entered into a WebCT site, and most were allowed to select their teams. The computer students, however, were assigned to ensure a balance in technological expertise. Detailed guidelines included individual and team responsibilities, including the requirement that all collaborative planning be conducted on the WebCT bulletin board. Transcripts of any chats were to be downloaded and posted to the team forum. Such a process allowed us as faculty to track participation and observe interaction.

COLLABORATIVE LEARNING

As professors at a multicultural university, we continue to reconfigure our collaborative projects in order to enrich the opportunities for our students to participate in learning communities. To foster this interaction, we merge the tenets of active learning with available technology. This process involves incorporating a variety of teaching strategies as recommended in current literature, replacing dependence on the traditional lecture mode. Following this model requires faculty members to adopt multi-sensory teaching styles in order to address a diversity of learning styles, including auditory, visual, and kinesthetic.

The model of teacher as all knowing, guiding the students to learning is in question, and teacher-centered has been altered to "learner-centered" instruction. Yet, in much of the distance learning pedagogy, modules are carefully crafted and distributed. Students are labeled as "active learners" because they can sign on any time, any place, follow a non-linear schema, and apply what they are learning. Nevertheless, is this really constructing one's learning? In this cross-functional team approach, the students experience the satisfaction and accompanying frustration of working at a distance to complete a project. Not only do they evaluate the process of developing the product using this

communication medium, they also reflect upon the strengths and weaknesses of communication and team interaction using computer-mediated communication (CMC) and gain insight for more effective team-building strategies.

Accepting this new role may make the teacher uncomfortable—not having all the answers. Things do not run smoothly; plans need alteration, and problem solving shared among professors makes collaborative projects as challenging for professors as they are for students. But the university encourages exploration, and we professors need to consider relinquishing control and outcome. Knowledge is no longer seen as an external to be discovered. Rather, it is a construct fostered by social interaction. As Sisko Mallinen argues, one of the greatest values of IT is to facilitate communication among students who never meet face-to-face, creating opportunities for them to enhance social skills as they are devising innovative solutions to specific problems (2001). The student, at the center of the classroom, constructs his/her experiences into observations, assumes responsibility for learning, and creates knowledge collaboratively. Mallinen cites as one example the interaction of marketing and English students from two polytechnics in Finland. Crafting such projects is more time intensive than traditional modes of delivery. Nevertheless, the intellectual energy generated by students in these collaborative endeavors benefits the academy and the society.

This energy in cross-functional teams paves the avenue for building emotional intelligence and innovation. Druskat and Wolff emphasize the importance of developing effective communication skills: "To be most effective, the team needs to create emotionally intelligent norms—the attitudes and behaviors that eventually become habits—that support behaviors for building trust, group identity, and group efficacy " (2001). A module in Business and Professional Speech Communication requires students to examine the interaction among team members--the roles that people play, trust, perspective-taking, and conflict resolution. Team building, especially in highly distributed environments, is essential in today's workplace. With the absence of face-to-face communication, technology enabled facilitation poses new challenges in a global environment. A common language (e.g. technological as well as English language skills), shared context, mutual respect and trust must be developed. Collaborative learning, including critical thinking, analytical methods, and communication effectiveness, prepares students for the virtual workplace.

Our computer-mediated collaborations fostered interactions of cognitive and social complexity, enhancing the intellectual energy of the students. By working together to gather and share information as well as to solve problems, they created a synergy. It, in turn, motivated the community of learners more than a similar project would if conducted in isolation. The 11th of the learner-centered principles of the American

Psychological Association highlights the social influences on learning: "In interactive and collaborative instructional contexts, individuals have an opportunity for perspective taking and reflective thinking that may lead to higher levels of cognitive, social, and moral development, as well as self-esteem" (1997). Developed to offer a framework for redesigning American's schools, the 14 principles are divided into 4 categories: cognitive and metacognitive factors, motivational and affective factors, developmental and social, and individual differences.

In the shared learning environment, we introduced several modes of communication. Course-management software enabled students to use a bulletin board and to view project drafts. We initially used IntraKal, the first package approved by our university. When WebCT was adopted, professors and students experienced less difficulty with the technology. Before the project began, all classes had been introduced or reintroduced to PowerPoint slide capabilities. Typically, the computer class had previously spent three to four weeks designing and writing web pages and thus was expected to use this knowledge in the joint project. Dreamweaver has replaced FrontPage as the software of choice throughout the university.

Most of the interchanges occurred through the course site. Issues of tone arose as students communicated in this unfamiliar environment, resulting in increased sensitivity to language. Messages posted to the bulletin board or sent to email accounts often languished in cyberspace before being answered, resulting in occasional misunderstandings by team members. Zhang and Harkness underscore this same sense of frustration among students engaged in virtual communication: "A common concern in a virtual environment is the feeling of 'talking to a vacuum.' Students expressed concerns and frustration about the delay and uncertainty of responses from others" (2002). In addition, the speech and English students, in particular, soon became aware of the nuances of tone as they critiqued the slides and handouts developed by their unseen colleagues. The lack of facial expressions, vocal inflections, and body language privileged the written over the spoken word. Collison, Elbaum, Haavind, and Tinker note that in online postings, the reader's perceptions assume priority over authorial intentions, often leading helpful commentary to be "misinterpreted, in the text format, as scolding, directive, or even sarcastic" (2000). Cultural differences accentuated these complications arising from aspects of tone in a silent environment.

In all projects, the English and computer information systems classes, held at the UHD site in an urban setting, had multicultural enrollment, adding linguistic variation and misunderstanding. The speech class, held at an off-site location near The Woodlands about 30 miles north of Houston, had an enrollment characteristic of the suburbs. The completed projects revealed that each group had developed successful strategies for solving the problems besetting any collaborative project. An asynchronous environment complicated the strategy-

building process; nevertheless, students enhanced their critical thinking and team-building skills as they devised creative solutions to challenging situations. In our last collaboration, workshop attendees reported that the information was valuable, noting in particular the informative handouts, the multimedia presentations, and the comfort level for participant interaction.

RECOMMENDATIONS

Admittedly, coordinating such a project is daunting and requires flexibility and risk-taking on the part of all the participants. Faculty members need to be at ease with a high level of ambiguity, providing a framework within which the students assume responsibility for their own learning. Reviewing our computer-mediated initiative, we reaffirm that collaboration in a virtual environment enhances the classroom experience for professors and students alike, and we suggest the following:

- Team-building procedures
  In future initiatives, we would introduce all students to the project and their team members simultaneously even though the timing for class contributions may differ. In the past, we have added classes to the teams as the semester progressed, beginning with English, adding speech, and ultimately incorporating computer information services. This procedure hampered the opportunities for building rapport with team members.
- Shared space
  Another limitation was the lack of shared space for creating the slides. For our most recent initiatives, we used WebCT and discovered its potential for enhancing the collaborative learning experience. We suggest exploring such products as Netmeeting, where members can work simultaneously to create and edit slides.
- Assessment procedures
  Confident of assessing students' skill with the technology and the content components of our project, we continue to seek tools for assessing the collaborative learning. In *Electronic Collaborators*, Curtis Jay Bonk and Donald J. Cunningham (1998) reinforce such a search, "Finally, this field is in dire need of learning benchmarks, signposts, and standards. How will CSCL (computer-supported collaborative learning) researchers and educators really know when they have made an impact on human learning? Certainly, new collaborative problem-solving or problem-finding assessments need to be developed and tested" (p. 44).

CONCLUSION

As technology is increasingly accessible and affordable, the push to offer courses and entire programs on-line to be competitive in the academic marketplace is thrust upon us. In this article we described our collaborative projects and offered recommendations for future computer-mediated team efforts. Developing team-building skills, using technology as a tool to communicate ideas, and creating multimedia products in a "classroom" experience provide students with the ground school before they test their wings. Experiential projects, such as our graduate exam workshop, help students construct and evaluate their progress in the context of real issues of importance. Learning communities comprised of cross-functional teams engage the student as well as the professor.

To prepare students for success in the new millennium, universities should consider crafting interdepartmental, computer-mediated collaborations among students. By exploring emerging dimensions for human discourse, they forge partnerships in a multicultural world and develop guidelines for operating in cyberspace. Moreover**,** as they retrieve, archive, and create information, they learn to discern and prioritize the essential, characteristics of critical thinking.

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