Collaborative Learning in an Internet Graduate Course: A Case Study Analysis

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It seems clear that the Internet and the World Wide Web (WWW or Web) are revolutionizing the ways we communicate and learn in business and industry as well as educational institutions. Whether we, as faculty, embrace these interactive technologies or keep them at bay, we cannot ignore their impact to our future and the future of our students as we educate them for an increasingly technological society. As Dede (1996) asserts, “Educators must help all students become adept at distanced interaction (gathering information) from remote sources and collaboration with dispersed team members. These skills are as central to the future American workplace as learning to perform structured tasks quickly was to the industrial revolution” (p. 30). Most importantly, as the technological revolution unfolds, we must embrace its critical assessment, specifically regarding the quality of instruction. Our particular interest is in the qualitative assessment of communication and collaborative learning in instructional settings.

In this article, we review the relevant scholarly literature on collaborative learning, and then examine and analyze the communication and learning environment of a graduate Internet course. In the premier issue of the WebNet Journal, Carlson and Repman (1999) raise the following questions for dialogue and analysis, which are relevant to the purpose of this article: “How can collaboration be encouraged in web-based environments?” [and] “How can real-world, contextualized experiences be provided in web-based environments?” (p. 11).

No doubt these questions were raised because collaboration is strongly advocated by scholars as an effective instructional strategy in the virtual classroom (Abrami & Bures, 1996; Harasim, 1990; Hiltz, 1998; & Turoff, 1999). Furthermore, collaborative learning (similar to cooperative learning) is a well-established instructional strategy in the traditional classroom. Research suggests that collaborative learning increases student motivation and achievement, promotes greater use of higher-level reasoning strategies and critical thinking, creates a sense of social cohesion, and creates a productive learning environment [Abrami et al., 1995; Johnson, Johnson, & Smith, 1991; Slavin, 1991].

Advocates claim that computer-supported collaborative learning (CSCL) is an instructional strategy that can help instructors avoid the pitfalls of Internet correspondence courses that rely on information acquisition and regurgitation of rote answers that reflect low-level learning (Dede, 1996; Pea, 1993; Savard et al., 1995). As Pea (1993) argues, “combinations of new computer technologies that facilitate collaboration and communication among learners can support...”

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and enhance learning, particularly distance learning” (p. 288). Dede (1996) claims, “Computer-supported collaborative learning enhances team performance through tools for communicating each person’s ideas, structuring group dialogue and decision making, recording the rationales for choices and facilitating collective activities” (p. 13).

Effective collaboration involves much more than students working together. They must value and perceive the importance of working actively with their peers in an interdependent structure. Effective collaboration means students think and act in ways that promote their own learning and that of others. Collaborative or cooperative learning is based on active learning methodologies that challenge students to construct their own knowledge or understanding. Active learning environments have a valued tradition in our educational institutions (Johnson, Johnson & Smith, 1991; Meyers & Jones, 1993; Brown, 1990). As Brown (1998) claims, “Learning is much more an evolutionary, sense-making, experiential process of development than of simple acquisitions”. He further elaborates that learning situations are successful when “they provide initially undetermined, threadbare concepts to which, through conversation, negotiation, and authentic activity, a learner adds texture” (p. 268). Therefore, we concur and further assert that, to be successful, active learning methodologies – in particular, collaborative learning – should be employed in the virtual classroom as well as the traditional classroom.

Collaborative learning scholars emphasize the interdependence of the learners and the communal nature in their construction of knowledge. (Bruffee, 1993; Johnson, Johnson, & Smith, 1991). Bruffee (1993) describes a university education as “an enterprise engaged in promoting change” and, as such, “we construct and maintain knowledge not by examining the world but by negotiating with one another in communities of knowledgeable peers. Similarly, collaborative learning assumes that learning occurs among persons, not between persons and things” (p. 9). Thus, in these pedagogical models, knowledge emerges from the interaction between and among instructors and students as they engage in problem solving real-world (authentic or contextualized) experiences. This is so in the traditional classroom, with its long established history. We argue, along with others, that it must be so in the virtual classroom as well. Hiltz (1998) has concluded from her research that “collaborative learning designs are more effective for online learning than pedagogical approaches that emphasize individuals working alone with materials posted online” (p. 6). Similarly, Turoff (1999) argues for collaborative learning as the methodology in the virtual classroom in which students “may communicate and work together as small project teams. It is the key difference that makes most of the quality improvements possible” (p. 22-23).

As educators transition their courses from a traditional classroom to an Internet learning environment, a paramount concern is maintaining the essentials of a collaborative learning environment. Carlson and Repman (1999) raise essential questions in asking, “How can collaborative learning be encouraged?” and “How can real-world, contextualized experiences be provided” in the virtual classroom? This article addresses those questions as it describes and analyzes the challenges of creating and maintaining a collaborative learning environment for graduate students enrolled in the online introductory graduate course for the Masters of Project Management degree program at Western Carolina University (WCU). Collaborating with others to successfully manage a project is what graduates of a project management degree program must be able to do. Thus, it is crucial that the design of an Internet course and a graduate degree program on project management simulate a “corporate world” experience and that individual students learn to work collaboratively with others as they manage real-world, contextualized projects as part of their course.

BACKGROUND OF AN ONLINE GRADUATE DEGREE PROGRAM

The Masters of Project Management degree program had been offered in the traditional classroom in Western Carolina University’s College of Business for 10 years. The College is fully accredited by the International Association of Management Education, AACSB and the Project Management Institute. Connecting through the Web, students receive instruction, interact with their instructors and each other, discuss issues, and actively participate in their classes.

Prospective students wishing to pursue this specialized degree have been full-time employees in business or industry, have family obligations, live outside of a reasonable commuting distance from the WCU campus, and found it difficult to take a full year out of their lives to pursue an on-campus graduate degree. The transition from the traditional program to the Internet format met the educational and the personal needs of these students and industry. The issue of maintaining high-quality, student-centered learning activities involving small group interaction and experiential learning was of utmost importance.
To facilitate the collaborative learning methodology needed in the project management degree program, WCU has licensed WebCT as a delivery vehicle. WebCT was tailored to include the following features:

- Assignment page with professor introductions to lessons.
- Chat rooms divided into designated “study groups” for students to synchronously discuss activities.
- Bulletin board/forum areas with two types of asynchronous postings in the forum areas:
  1. A “public” forum for general posting area of all final group work products for all classmates to read and comment if desired or required by the professor;
  2. A “private” forum working area or lesson-specific final product forum for postings to be shared within the team alone.

(A “main” forum, a general default forum within the WebCT program, created problems in organizing and locating material, so individual lesson forums proved to be more manageable with the enormous amount of information being exchanged.)

- Mirabilis ICQ, a free-ware product, provides an immediately reachable (not buried within the layers of WebCT passwords, etc.), brief e-mail capability that can be transitioned quickly into a chat request with pre-designated parties.

Additionally, standard e-mail messages and attachments, telephone and telephone conferencing, fax, and regular mail supplement the online activities of the students. Microsoft NetMeeting or CU-See Me software for synchronous video and voice streaming discussions/communications are planned for later implementation for the entire class, although several students have used this as one of their communication alternatives.

COLLABORATION IN RESEARCH: PURPOSE AND METHODOLOGY

The purpose of this article is to provide a case study analysis of how collaboration, along with real-world, contextualized experiences, were integrated into a web-based environment. Specifically, the purpose was to analyze the challenges of creating and maintaining a collaborative learning environment for the introductory project management course (PM650) offered online for the first time in the fall of 1998. There were 14 graduate students enrolled in this course, pursuing a graduate degree and certification in project management. Eleven of these individuals worked full time in managerial positions in a variety of business and industry settings and three were full-time graduate students with part-time jobs.

Collaboration was not only the focus of this research, but the research itself was a collaborative effort between the major course professor and course designer (second author) and a communication education professor and researcher (first author). We present our observations and analysis of the collaborative learning environment from these dual perspectives. As a researcher, the first author has examined communication and learning in a variety of educational settings. One analysis looks at the impact of an interactive teleclassroom environment on classroom communication (Comeaux, 1995). Students in PM650 were introduced to the first author as “a visiting professor” whose purpose was “the collection of descriptive data (details of the interactions between and among students, professors, and technicians) that related to the issues of communication and collaborative learning.” In addition, students were asked to respond to the first author’s end-of-course interview questions group dynamics within their teams and the communication and collaboration that took place with each other and their instructors. Throughout the semester, the two researchers communicated weekly about their observations and reflections of the course, as well as the students’ communication and work in teams. At the end of the course, they both re-read and analyzed the communication between and within teams as posted in the working forums, in the main forum (bulletin board), and in the students’ responses to the end-of-course interview questions.

ESTABLISHING THE COMMUNICATION AND COLLABORATIVE LEARNING ENVIRONMENT IN AN ONLINE GRADUATE COURSE: PM650

As literature on group process and successful teambuilding details, groups must be held accountable for their communication process as well as their task product (Rothwell, 1998; Harris & Sherblom, 1999). Knowing how to communicate and work successfully in a team comes with knowledge, experience, and from the structure of the task. In other words, pedagogical designs that
take advantage of collaboration must incorporate suggestions on communication and the process of working together. As part of the Master of Project Management Degree Program at Western Carolina University, students enrolled in this graduate Internet course had access to suggestions for succeeding with online courses. In addition to the usual technical guidelines and help provided for students taking online courses, students were reminded that “success in an Internet course greatly depends upon understanding how to communicate with instructors, fellow students, and how to navigate through the course.” They were also reminded that, in the virtual classroom, “you won’t have all those nonverbal cues that you get in the physical classroom and neither will your instructor. Words on the screen help the instructor ‘see’ you much more clearly” (PM650, Posted August 30, 1998). Furthermore, the students were provided with detailed suggestions for communicating effectively, clearly, and ethically in their virtual classroom.

In addition to these general communication guidelines, student teams were provided direct and encouraging feedback to help them persist in the complex process of developing loyalty and commitment to a team. So while students were encouraged to work toward cohesiveness and build commitment into their teams, their instructors encouraged them to work and learn collaboratively. The students were provided with the following feedback early in the course as they were establishing and developing their teams:

In our teams, not everyone has to participate in every assignment. However, each person is expected to learn from every assignment. As committed team members, we can work on and complete team assignments that a team member has to miss, and we can help him or her learn the materials. Why should we do this? First of all, because it is the right thing to do, in the moral and ethical sense, to support a friend. Second, it increases commitment to the team, not only from the person who experienced the problem, but also from the members of the team that helped. We also support other team members for a very selfish reason: if that team member has to drop out, the team loses skill, experience, and capability that may not be possible to replace, the loss of which will make our jobs more difficult and perhaps impossible. And in the final analysis, we help our teammates in the fond expectation that they will help us out the next time around, when we’re the one with the personal or professional problem! (Professors, PM 650, Posted October 1, 1998).

In addition, the course design asked for students’ responses to their collaborative work and assignments. An example from Lesson 3 week of classes provides another way of promoting collaborative learning by asking students to respond to its effect on their work. Students were asked to respond to the following questions regarding their second team project which challenged them to “analyze an organization’s project life cycle to determine its strengths and weaknesses for a given project” (PM650). While the actual assignment provided students with real-world contextualized experiences (they used examples from each of their own organizations to critique), the follow-up questions asked them to reflect on the value of learning and working collaboratively.

1. Please react to and provide your first impressions to this integrative, team-building assignment to your professor.
2. Did you enjoy your experience? Why or why not?
3. Was the composite model produced an improvement on each of the individual systems submitted by the team members? Explain.
4. Were you able to learn about and improve your understanding of your team members? Explain.

COMMUNICATING AND LEARNING COLLABORATIVELY IN A VIRTUAL CLASSROOM: THE ESSENTIAL ELEMENTS FOR SUCCESS

Scholars and proponents describe the essentials of collaborative learning as positive, interdependent purpose, cooperative goal structure, interdependent division of labor and resources, and individual accountability. Students working together should know: (a) why (purpose and goals), (b) how (procedures and tasks), (c) with whom (group composition), (d) the ground rules (interpersonal and group skills), and (e) be held accountable to the group (Abrami et al, 1995; Johnson, Johnson & Smith, 1991; Rothwell, 1998). In the course design and throughout the course, PM650 students were provided with clear reasons and motivation to work together since that is what they do in their role as project managers. They were provided with clear instructions regarding their assignments and the procedures required for accomplishing them (an example of a teambuilding assignment is detailed below). Students learned, early in the course, the personal and professional background information of the individuals on their team and on the other teams. Students learned the ground rules for communicating online and
they were held accountable to the group through the group grades as well as the encouragement and support provided by their professors and by each other, as evidenced in the working forums. The following excerpt from their professors provides a clear illustration of the crux of the communication and learning environment established in PM650. It was an environment structured around the value of building cohesiveness and commitment in a team:

We know that effective, close-knit, and committed teams are absolutely essential for the accomplishment of complex projects, and that this educational program is a complex project for each one of us. The more complex the project, and the longer its duration, the greater the requirement for commitment from the team members. We know committed teams can be achieved electronically – successful virtual projects are alive and well. Everything we know about managing effective projects predicts that successful virtual projects will demand highly cohesive and committed teams. Such teams are made up of members that close ranks, pull together, and help other team members when problems (personal or professional) arise and have to be faced (Professors, PM650 Posted October 1, 1998).

Team building and collaboration were the foundation and connecting threads of this six-hour graduate Internet course. Teams formed the basis for all course assignments and projects. Seventy percent of the grade came from assignments – team assignments had the same weight as individual assignments. Sometimes there was an individual and a teamwork product for the same lesson. The other 30 percent of the grade was the final exam. All of the work that students accomplished in teams functioned to provide different perspectives, interpretations, and experiences about the assignment from their individual backgrounds in project management on their jobs, in their searches on the web, or in their interpretations of the reading assignments. They had active discussions about necessary information and the best way to retrieve it, processing it, and manufacture a final product to meet the requirements of the assignment.

The whole course was structured around teams. Once the teams were formed, each week’s lesson instructed students to individually read designated chapters or articles (which could be downloaded from the Internet), respond to particular questions or complete a task, share responses with their teammates in their designated private working forum, and then post final responses to the class forum. The tasks that students encountered in their project management course were similar to what they would encounter in their workplaces. For example, in the third week of the course, students were asked as individuals to “prepare a draft SWAT (Strengths, Weaknesses, Opportunities, and Threats) analysis that defines your employer’s current strategic situation (for one product, for one division, or for the organizations as a whole).” They were then asked to share their work with their teammates and “critique each other’s work and make whatever changes you think are appropriate in your analysis.” Students were then asked to submit their final SWAT analysis and “the critiques you provided to your teammates as an e-mail attachment to the professors.” In addition, they were required to respond to the following questions and post their responses to the professors as an attachment to an e-mail:

1. What is the connection between the organization’s strategic plan and the creation of the project to be completed within your organizations?
2. From a Strategic Management perspective, what is the primary purpose of projects within your organization? Within organizations in general?
3. How could your organization improve the way projects are targeted to accomplishing the PRIMARY objectives(s) that the organization had in mind when the project was established? (Lesson 3, PM650)

In this example, although the final product is an individual submission, each student’s product is dependent upon input from his or her teammates. In addition, students were held accountable for their feedback to their teammates.

**SETTING UP TEAMS FOR LEARNING AND WORKING COLLABORATIVELY IN AN INTERNET GRADUATE COURSE: PM650**

In addition to the rules for communicating in the virtual classroom, students in PM650 were required to “meet” each other, as this was the first course in their two-year graduate degree program. It is not uncommon for traditional classes of this nature and size to have a whole class devoted to “becoming acquainted.” If individuals are to collaboratively construct their knowledge, then they need to build a trusting and respectful community where they can take risks and learn. It is crucial to establish a personal and comfortable atmosphere in which individuals are willing to explore ideas and work directly with their teammates or classmates to complete course assignments and projects. As Harasim (1990) suggests, online collaborative learning environments must provide structures...
in which students can “generate, link and structure ideas...in order to facilitate sense making and knowledge building within online group discussion activities” (pp. 55-56). Becoming acquainted in a web-based learning environment can be a challenging and a creative venture. The first assignment for graduate students enrolled in PM650 was to create a “comprehensive, informal Vita/WebPage of yourself.” Students were asked to mail pictures to the university so the webmaster could scan them with their introductory biography describing “you as a person, your educational background, job experiences and special skills, your hobbies, your family, and your preferred working hours for this course” (Lesson 1, PM650).

Some students took this opportunity to inform their classmates of their personal and work challenges. Some students ran into technical difficulties in attempting to post their vita. They were able to receive prompt and competent technical assistance from one of the webmasters. In addition, one of the students in the course was a graduate assistant with a wealth of technical experience and skills. Therefore, he offered to serve as a “student liaison for the program.” It seems reasonable to conclude that this prompt and competent technical assistance was vital to the success of the course. While it may be a challenging as well as rewarding to work collaboratively in a web-based environment, it can be frustrating for those that lack computer and technical expertise. Thus, it is reassuring to know that “somebody out there can help you” (Student Interviews, December 20, 1998).

Introducing yourself to strangers with whom you will work can be an intimidating experience. We all understand the importance of first impressions. How you present yourself to others for the first time is a challenging and somewhat daunting task. Experiencing a concern for self-image and self-presentation is a commonly accepted human trait (Goffman, 1959). When preparing to meet others for the first time in a face-to-face environment, we attempt to present acceptable images of ourselves through dress, appearance, tone of voice, and use of gestures as well as careful attention to the words we speak. The presentation of self in the virtual classroom presents individuals with the same concerns yet with different modes of communication with which to construct and manage an acceptable and appropriate image. Thus, to present an acceptable self-image in the virtual classroom requires technical skills as well as creativity. The student biographies in PM650 ran the gamut at the beginning of the course, from straight, formal text with a list-
mates, they received their team assignments. Thus, they were able to begin the crucial work of teambuilding. To be successful, participating in a team must be valued and built into the structure. Individuals must benefit from their participation in a team. The lesson on teambuilding had all the potential for creating strong, productive teams because the professors not only structured the whole course around working in teams but addressed essential issues of team success from the beginning. Too often, instructors will expect students to work in a team and produce a quality product without reviewing the principles of group or team process.

In several of their assignments, students were required to submit their final work as a team. For the purposes of this analysis, one particular teambuilding assignment is examined for its application to the methodological design of the course. It is apparent that developing effective teams is crucial to the individual student as well as crucial to the successful project manager. Since virtual teams will become more common, place, it is essential for graduates of the project management degree to know how to develop and sustain a successful virtual team. As the professors for the course stipulate:

We have said several times that the latest major development in project management involves the virtual project. The virtual project is simply an extension of the concept of project management into an all-electronic communication system, where recent development in the web-based technology infrastructure for communications promises to allow projects to be completed without the participants ever meeting face-to-face...Furthermore, the major developments in the project management field today have to do with development of the electronic infrastructure that is revolutionizing communication in the project world (Professors, PM650, Posted October 25, 1998).

In the third week of the course – after the biographical vitas were posted and read by all class members – students were placed in four teams and presented with the challenge of laying the foundation for an effective team with their Lesson 2 assignment. The learning objectives for this teambuilding lesson are: (a) establish lines of communication with teammates, professors and support team; (b) enhance understanding of individual team members’ experiences and perceptions regarding teams and, develop a shared model of how to function effectively as a team; (c) evaluate the current team and individual team members; and (d) generate a prescriptive outline for overcoming team limitations and maximizing the benefits of team strengths. To accomplish the first learning objective, students were asked to examine the vitas of their assigned team members and communicate with each other using the available online modes: working forum (private to their team), bulletin board, the chat room, and e-mail. Through these exchanges each team was to decide a team name and select the team member (to start the rotating designation) responsible for posting the final team work product to the Final Forum. To accomplish the second learning objective, students were asked to brainstorm as a team, reflect on past experience working in teams, and arrive at a consensus of the three most common pitfalls or critical limitations in working with teams. In addition, each team was asked to delineate how they could prevent these limitations from occurring. To address the third learning objective, students were asked to create a brief list of “your perceptions of the potential strengths and weaknesses of each team member and the team as a whole.” To accomplish the fourth objective, students were asked to provide a concrete, prescriptive list of ways to maximize the strengths and minimize the weaknesses of each team member.

As evidenced in the examined assignments from PM650, in conjunction with the scholarly literature on collaborative learning, it seems clear that this introductory online graduate course provided students with the essential elements and structure needed to develop and maintain an effective, collaborative, learning environment. In addition, the course design and assignments required that the students examine their own and each other’s real world (work) projects as they were learning about the theories and practice of project management.

**IMPACT OF COLLABORATIVE LEARNING AND COMMUNICATION IN PM650: RESPONSES FROM PROFESSORS AND STUDENTS**

There seemed to be a high correlation between developed processes of learning to work collaboratively and quality of product. In PM650, the factors that seemed to contribute to this correlation were individuals on the team setting up a process, sticking to it, and expecting their teammates to do the same thing. Individuals worked to insure effective communication methods were established and maintained, and the appropriate communication media were employed to work together effectively and efficiently. Individuals within teams took turns taking the lead on projects to establish deadlines and procedures for submitting their completed team projects. These factors are evidenced both in the interviews with
the professors and the students. As one of the professors explained:

I think peer pressure when working on the teams is similar to that of exercising. It is easy to procrastinate if you are only hurting yourself with the omission; but when there is someone else out there depending on you to come through with a portion of the work, you are more likely to do so. So in that sense, the quality and the timeliness of the group process increased the quality of the work product. However, the experience and general quality of each team member made the final push into an excellent or outstanding work product (Professor, PM650, Personal Interview, February 10, 1999).

Similarly, students’ testimonies from the end-of-course written interviews attest to the importance of the established communication and working processes in their team. They were asked to describe the communication strategies that they found helpful within their teams. Their responses, regarding the adjustment and value of working in teams in a collaborative learning environment, included the following:

• Getting to know each other at the beginning was stressful and difficult. Each of us now appreciates the others’ strengths and weaknesses. We now have a strong team that knows each other very well and how to complement and compensate these strengths and weaknesses. In short, we rely and depend on each other to get the projects done (Team #1, Student Interviews, December 20, 1998).

• At the beginning, our team made a conscious effort to get to know one another and to understand each member’s time constraints, travel, social, and family requirements. We have developed good working relations with one another and our expectations are right up front (Team #2, Student Interviews, December 20, 1998).

• Over the duration of the course, the team was able to get a feel for each other’s strengths and weaknesses. That familiarity allowed some increase in interaction efficiency (Team #3, Student Interviews, December 20, 1998).

• We developed, over the course of the semester, a very responsible and committed team that worked very well together (Team #4, Student Interviews, December 20, 1998).

**IMPACT AND RESPONSE TO TECHNICAL ISSUES: PM650**

The technology provided the tools to enable a higher and more consistent level of communication and interaction. Additionally, individual students have shared their discoveries of tools and techniques that enhance their communication processes. This sharing of information added depth and flexibility to the program and enhanced the teambuilding/team successes and motivations. Most of the students have an open-minded approach to new techniques and technology, and we are willing to try different tools. The students seemed to be open-minded and flexible about the use of technology to support the communication needs of the collaborative, learning, team format. One team chose to use *Mirabilis ICQ*: this tool gives the advantages of both a bulletin board for short messages for pre-selected people and an ease of conversion into a chat format. It has a message notification feature that lets the user know, immediately upon connecting to the network, that a message or chat request is waiting. The team selected this tool because of its versatility and ease of use, rather than the embedded chat and bulletin board functions of WebCT. The professors have now incorporated this tool into the course for the rest of the students.

As might be expected, the different teams selected different methods of communication exchange depending upon the needs of the individuals within the teams. One team used the chat room so frequently that they established a fairly formalized procedure entitled “Chat Format.” The procedure began with “no more than ten minutes for social interaction” and included a “chat leader” who was responsible for leading the discussion and facilitating the “assignment of tasks and due dates for the up-coming project” (Team #1, PM650, Posted November 22, 1998).

Chat rooms provide a linear display of written information as it is submitted in a first-come, first-posted sequencing. Some students found it distracting that the words appearing on the screen did not follow logical thought progression of a normal conversation. In a face-to-face discussion, humans have learned to filter out extraneous noise or distractions and make sense of messages coming from multiple sources. In face-to-face conversations, we use our auditory and sight sensory preceptors as well as our intellect to make sense of verbal and nonverbal messages. In chat rooms, however, there are no sights or sounds, only the linear written words. Thus, participation requires the ability to respond quickly with both the mind and the fingers. As one student explained, “We found the chat room cumbersome and slow to draw in thought development – my mind is much faster than my fingers. So our team used telephone conference calling as opposed to chatting because it is a wonderful tool to actually talk.
things out and listen to ideas from each other” (Team #2, Student Interviews, December 20, 1998). Telephone conferencing was available through the team members’ workplaces. As the course continues to evolve, quick cameras and video and audio streaming capability will be incorporated into the tools used in the course.

All teams relied heavily on e-mail messages or the working forum to keep in frequent contact with each other. In the collaborative nature of this course, some individuals helped bring their teammates up to speed technically. This is evidenced in the following e-mail message of one team member to another:

If you post a related forum message, it is better to click on the message you have something to say or post about. Then wait till you see the message, and click on Reply or Quote. In this way, all related forum messages will stick together, which allows us to have a “clean” work forum. This process is called “threading.” Take, for example, this message. It’s threaded onto your forum message (click on Show All and scroll down to see what I wrote (Working Forum, PM650, October 12, 1998).

Certainly the working forum as an online discussion tool worked well for the teams because of its threaded discussion features and its asynchronous nature. Communication scholars, among others, are examining the features and viability of computer-mediated communication and online discussions (Althaus, 1997; Kuehn, 1994).

PROGRAM CHANGES TO PROBLEMS DISCOVERED IN THE MPM DEGREE PROGRAM

In response to the student feedback received throughout the course and in the end-of-course evaluations, we made several administrative changes and refrained from making others. First, at the students’ request, the original teams were left in tact rather than shifting team members to other teams, as they would normally be in a real-world project. Students felt that it had taken a good part of the semester to overcome the technology challenges presented in just taking the course online; and, they had worked through various problems and challenges normally expected in working with teams.

Second, students expressed a preference in the professor’s posting of two-week assignments with due dates for final work products remaining on a weekly or bi-weekly basis if the dual assignments necessitated. Just as in the real project world, a longer lead-time gave them much greater flexibility in coordinating the course work with their family and work requirements. Thus, in their online courses longer lead-time gave them the ability to multi-task and schedule the assignment allocations among themselves. Students also noted as they learned more about projects through the course work, that each assignment was a project in itself and they began to apply classroom theory to the accomplishment of classroom tasks.

Third, students really appreciated immediate and detailed feedback. This obviously put a much greater burden on the professors. However, providing a “general comment” about the lesson (copied and pasted from a saved .doc file for that lesson) and individualizing the general comment with specific comments for the student or the team was much appreciated by the adult learners. They also appreciated the real-world applicability of assignments and the cross-industry input from their teammates. Where possible, their assignments analyzed an aspect of their own projects (real work world). Naturally, different industries handle specific situations according to their industry standards. Students in one type of industry have enjoyed insight into how their teammates in another type of industry handle similar situations with a slightly different approach which may or may not have application in their own settings.

In the second semester, a case study was presented and all follow-up assignments pertained to the team’s decision to present a proposal to upper management concerning the feasibility of a project for the company. The whole class competed for the corporate priority project classification. The diversity of the team’s backgrounds and levels of experience encouraged a high level of interaction within the team as each team member had a separate portion of the team project to prepare for the team’s success. The natural spirit of competition added zest to the learning process. The teams benefited from the applicability of this process in their own companies.

Administratively, the professors spent an excessive amount of time searching for final work products, some required of each individual, others required from an entire team. Assignments were submitted with attachments that couldn’t be opened, lesson work products were posted in an area designated for another lesson, students thought they had submitted a lesson work product when they had not. As originally designed, admittedly in a traditional classroom manner, we “collected” all like assignments at one time and in one place; all final work products for a lesson were to be submitted in one place designated for that particular lesson. This problem has been resolved by creating a specific file for each student or each team to post all their final products. Lessons can easily be identified if titled correctly by the lesson numbers, and material is also posted chronologi-
cally as it is received. Both the professors and the team members have access to these files and can verify that the assignments have been posted.

CONCLUSIONS AND RESEARCH SUGGESTIONS

Whether in a business or educational setting, collaboration is an integral part of how we work and learn. As the Internet and Web continue to revolutionize our worlds, we must pursue ways to structure web-based environments to meet the human communication needs of the end users. Thus, dialogue between and among researchers, developers, and Internet users must be supported and encouraged as new discoveries in the world of interactive technology continue to be made.

Based on the review of the literature and this case study analysis, further research-comparing what we know about effective collaborative learning environments in the traditional classroom with what is possible in the virtual classrooms of the future—should be encouraged and pursued. In addition, future research should consider longitudinal studies that follow cohort groups or teams through the completion of their online degree into the workplace. It would be instructive in such longitudinal studies, to examine the correlation between what individuals learn about collaboration and teambuilding and how that impacts their performance on the job.

REFERENCES


APPENDIX A:
The listing below provides an overview of the composite and work experience of each team:

Team # 1:

- Three of the four members were full time graduate students who worked part-time.
- Two team members were in their early 20’s; the other two were in their early 30’s and early 40’s.
- One member had 10 years work experience in management positions; a second member had one-year experiences as a credit analyst for a bank and the other two members had part-time work experience as they attended college.

Team # 2:

- All three members work full time in management positions for industry, communications and banking organizations.
- All three members are in the late 30’s and early 40’s.
- All three members had worked in managerial positions for over 15 years.

Team # 3:

- Two of the team members held managerial positions in the computer industry and the third member was a research analyst for health care industry.
- The three members were in their mid-thirties to early 40’s.
- One member had 12 years work experience and the other two had over 15 years experience.

Team # 4:

- All four members held managerial positions; two worked for manufacturing firms, one for an energy company and one was a consultant for information systems.
- The four members were in their mid-forties to early 50’s.
- All four members had over 15 years career work experience.