

Distributed Learning for Geographically Dispersed Students: Lessons Learned for an Online Graduate Business Course.

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Abstract

This article describes a program at a University that serves a large but sparsely populated state. It offers two MBA programs, a traditional full-time program and a part-time, off-campus program. Students in the off-campus program are typically early to mid-career professionals. To reach them the University's School of Business Administration developed expertise in innovative, distributed learning. The objective of the distributed learning program was to integrate networked delivery to students across the region. Professional courses are conducted on interactive, compressed video delivered to nine sites scattered around the state. Graduate-level foundation courses, i.e., courses in the fundamentals of business administration, are delivered online to the same students. The *Systems and Operations* course described in this paper was the first of five foundation courses developed for delivery online.

Introduction

This paper describes a program that offers a M.B.A. Degree to both full-time students enrolled in daytime classes and to part-time students enrolled in the evenings. Similar to other smaller American Association of Association to Advance Collegiate Schools of Business (AACSB International) schools, this program relied on a CORE of undergraduate business classes to satisfy its “Foundation Program,” or its first year of course work. Students entering the program with undergraduate degrees in business (approximately 50% of those admitted) had these foundation courses waived; others had to complete a set of ten undergraduate courses prior to moving into a “Professional Program” in their second year.

During the 1990s, the MBA program was expanded to a host of geographically dispersed locations; the method of delivery was the State’s Educational Telecommunications Network (METNET). Other 4-year and 2-year college campuses that were part of the University System hosted students on Tuesday and Thursday evenings using interactive compressed video delivery from the main campus. This method of delivery was used primarily for required professional program courses (600-level). Eventually, geographically dispersed students in nine other communities were connected with the main campus of the University.

Local students could enroll in the foundation courses at the main campus. Unfortunately, that infrastructure did not exist for off-campus students. Some of the METNET locations were on community college campuses where upper division business courses were not offered; others were on 4-year campuses where such business courses were available only during the day to a resident population of students. Students enrolled in the off-campus program primarily were early to mid-career professionals who had regular jobs during the day and needed to attend classes in the evenings.

In 1998, a new Foundation Program was developed that not only satisfied the AACSB International requirements for the MBA CORE areas but also facilitated access to foundation courses and improved the overall quality of the program. The objective of the new Foundation Program was to provide students with graduate courses taught online. Thus, access was opened to working professionals who needed the courses; working online enhanced their learning

experiences as well. The use of online courses expanded the University's distributed/distance capability to a new dimension.

Distributed learning is based on learner needs and allows students and faculty to enter the learning environment at different times and from different locations (Oblinger & Maruyama, 1996). The instructional events that traditionally occur in classrooms are distributed to learners (Dede, 1996). Distributed learning involves educational activities in classrooms, workplaces, homes, and in community settings (Dede, 1996). Learning can occur at the same time in different places, at different times in the same place, or at different times in different places (Locatis & Weisberg, 1997). Graves (1997) described distributed education to encompass distance education, but reaches further to integrate the networked delivery of learning through asynchronous and synchronous conversations within learning communities of students. He noted that the promise of distributed education is to increase access to instruction and to enhance the quality of students' learning. Distributed learning blends the use of appropriate technologies to enable opportunities for learning.

The first of five courses developed as part of the new Foundation Program was *Systems and Operations*, the subject of this paper. Another course developed for the Foundation Program was *Financial Reporting and Accounting*, the subject of a paper published in the proceedings of the *American Society of Business and Behavioral Sciences* (Bruneau & Herron, 1999). Three other courses rounded out the new Foundation Program: *Marketing and Applied Business Statistics*, *Principles of Financial Analysis*, and *Management and the Legal Environment*. These five courses were offered as an alternative to completing several undergraduate business courses to satisfy the MBA CORE (see Table 1). Two courses were scheduled in fall semester, two in spring, and the fifth in the summer immediately preceding the second year of the program (i.e. the Professional Program). This paper will discuss the objectives and technical features associated with the Foundation Program, as well as address the development and lessons learned over the first five years of the *Systems and Operations* course.

Table 1: Old and New Foundation Program

Old Foundation (Undergrad)	Hrs		New Foundation (Grad)	Hrs
Financial Accounting	3	→	Financial Rpt. and Accounting	3
Managerial Accounting	3	→		
Microeconomics	3	→	Financial Analysis	3
Finance	3	→		
Marketing	3	→	Marketing and Applied Statistics	3
Statistics	4	→		
Business Law	3	→	Management & Legal Environment	3
Organizational Behavior	3	→		
Management Info. Systems	3	→	Systems & Operations	3
Operations Management	3	→		
TOTAL	31		TOTAL	15

Educational Objectives of the Off-Campus Program

The off-campus MBA program's primary concerns are relevance, quality, and geography. The program's *mission* is to provide relevant, quality education to geographically remote graduate students. Its *distinctive competence* is distributed/distance learning, particularly in the areas of interactive compressed video and online learning. Its *policy* is to offer every qualified individual in the region an opportunity to earn a MBA degree. Consequently, each of the five courses in the Foundation Program including *Systems and Operations* was designed to achieve the following objectives:

Relevance and Quality

1. To provide each student with a challenging and rewarding educational experience
2. To satisfy an AACSB requirement in a MBA CORE areas.
3. To enhance students' basic skills in communications, quantitative analysis and computer usage.
4. To develop a courses that applied cross-functional approaches to organizational issues.

Geography

1. To enable qualified students throughout the region to participate in the program.

2. To eliminate (or at least minimize) distance as a barrier to learning.
3. To create an environment in which geographically dispersed students can function together as organized teams.
4. To provide multiple means of communications between instructor and students, as well as within and among organized teams.

Technical Innovation and Unique Features

A course design team developed the School's online learning environment. The team used information technology to meet the instructional needs of *Systems and Operations*, as well as other MBA foundation courses. The team had faculty, staff, and student workers as members. The faculty were responsible for course content and instructional expertise. The director of information technology designed the online environment and provided multimedia development and instructional design knowledge. The student workers created web pages and provided knowledge and support on Internet technology. Finally, library support was available to assist with the use of library resources.

The original online environment used an open design based on computers, servers, and networking equipment from Hewlett-Packard, and software from Microsoft. The server software included Windows NT Server, Internet Information Server, Microsoft Exchange Server, Microsoft Site Server, and Internet Locator Server. The instructors used Microsoft Office and FrontPage to develop the learning materials by modifying templates created for an online course. Students connected to the Internet through an Internet Service Provider; using Internet Explorer, they supplied usernames and passwords to access the secure, online learning environment.

The original home-grown platform was designed and supported in-house because the course management systems available in 1998 were in their infancy and provided few advantages over what could be created and supported internally. This home-grown platform was changed in the fifth year of the Foundation Program (2002) to the Blackboard (Version 5.5) Course Management System. Blackboard and other course management systems offered many features at that time that were too expensive to create and support with the home-grown platform. The enhanced features included easier access for students, online testing, online tracking of student

usage, and streamlined tools for administering the online learning environment. The School found that the license fee paid to Blackboard on an annual basis (\$7500) made more economic sense than the funds required to employ programmers to continually update and make changes to the home-grown system.

The original home-grown course management system and the current Blackboard system delivered course content via Web pages, through texts, readings, PowerPoint slideshows, and other media. Chats, threaded discussions, and email software facilitated interaction, which enhanced the learning experience (Tiessen & Ward, 1997). Chat and Microsoft NetMeeting were utilized for synchronous classroom discussions, office hours with the instructor, and to facilitate group projects among geographically dispersed students. Email was an asynchronous tool used for clarifying questions between students and instructors, keeping electronic journals, and facilitating student-to-student communications. The *announcement area* was used to post timely information relevant to the course. The *threaded discussion area* was used for asynchronous interaction where the conversation topics were organized in threads. Discussion and announcement areas were effective tools for reducing the amount of email that students and instructors received.

Online access to electronic databases and other library resources was essential to the support of graduate students enrolled in the MBA Program. All students had online graphical access to full-text databases. Students were authenticated through a central process to meet the licensing requirements of the electronic database providers. In addition, the library scanned and posted materials placed on reserve by instructors as PDF files in a secure, *electronic reserve area* of the library's server. Students were able to download these materials using Acrobat Reader.

The technical support staff provided assistance to both the faculty teaching the online course and the students enrolled. The School hired and trained student workers to serve as members of the technical support team. These individuals worked with a full-time director, a media specialist, and a full-time network administrator. The team stayed current with the latest developments and guidelines for using online learning technology, and solved problems that arose within the learning environment.

The technical support team also provided one-on-one training with the instructors on how to develop course content, utilize various collaborative tools, and the other features available in the course management system. Each student in *Systems and Operations* received a personal phone call to help with technical questions or problems associated with accessing and using the online learning tools. This call and personal contact helped reduce the technological stress associated with taking an online course for the first time (Everett, 2000 and Lim, 2001). Finally, there was a *technical assistance area* for *Systems and Operations* that was developed and maintained by the technical support team. The area contained guidelines for using the learning tools; it was also used to answer frequently asked questions.

The role of the technical support team was shifted to providing more assistance to faculty and students due to the technological advances of the Blackboard course management system. Previously, the home-grown platform required the support team to spend considerable time making sure the technology worked and developing new tools to make the course more functional for faculty and students. Currently, the Blackboard course management system has built-in tools that made the administration of the courses much easier. This shift enabled the support team to concentrate more on the areas of instructional design and providing one-on-one assistance for faculty and students.

The Course

Systems and Operations was a 3-credit semester course with enrollment restricted to 25 students per section. The average class size was 20 students. Originally, the text was a custom text ordered from McGraw-Hill; it consisted of chapters taken from both an information systems text and an operations text. The custom text, however, was incoherent and confusing. Moreover, resale value was disappointing relative to the initial cost. Thus, students are now required to purchase both the systems and the operations texts. *Systems and Operations* was a cross-functional course; it bridged the gap between the design and utilization of information systems. The first half of the course was devoted to systems analysis and design, where students learned modeling and systems design. The last half was devoted to the operations function, where

students learned how to use information systems to plan and achieve Operations' tactical and strategic objectives.

The course was challenging because it abandoned the analytic approach practiced by functional managers in favor of the systems approach advocated by Meredith and Mantel (1995). This cross-functional or holistic perspective contributed to learning by exposing students to the whole organization rather than just a part of it. As a result, they acquired a better understanding of the set of interrelated functions that accepts inputs and produces outputs in a purposeful way.

The Process

Systems and Operations was delivered on the World-Wide Web. The project that launched the course was funded by the University's Department of Continuing Education. The initial phases of the project consisted of a requirements definition and a feasibility study. The course requirements followed the principles of good practice in education (Chickering & Ehrmann, 1996) and specified that the instructor must be able to:

1. Post information on the Web (e.g., syllabi, profiles, assignments, notes, readings)
2. Interact with students in a time-independent manner
3. Interact with students in a real-time manner
4. Deliver exams in a secure environment
5. Enable geographically dispersed students to work together in groups

The subsequent feasibility study investigated various software products that met the above requirements. The Microsoft and Blackboard products selected provided for communications by electronic mail, electronic conferencing, threaded discussions, and real-time chatting.

Modules

The course was organized into 28 modules and 12 assignments. The modules were linked together; they consisted of class notes, which augmented the text material and substitute for traditional classroom lectures. Key words in the modules were linked electronically to a glossary. With permission of the *American Production and Inventory Control Society*, the glossary contained definitions from the *APICS Dictionary* (1998). Each module represented one

class or 80 minutes of instruction. Originally, the notes were programmed in HTML and posted to the course web site. Now, Microsoft FrontPage, Microsoft Word, and Blackboard are used to make changes as well as create assignments and exams that are posted to the online learning platform.

Assignments

The assignments were delivered online and augmented the syllabus. Assignments were posted to the course web site on Friday mornings. They included the following:

1. Administrative details
2. Supplemental materials (e.g., outlines, readings, notes)
3. Team assignments (e.g., names, locations, phone numbers, and email addresses)
4. Homework assignments (e.g., problems and discussion questions)
5. Due dates (e.g., case study installments)
6. Event dates (e.g., discussion groups and exams)

Group Discussions

Originally, the instructor used Microsoft NetMeeting to initiate and conduct three or more discussion groups online. Students could and did initiate discussions as well; thus, students used NetMeeting as a means of communicating. NetMeeting enabled students to conduct real-time audio, video, and data communications over the Internet. NetMeeting was replaced in the fifth year of the class with a synchronous text based chat tool from Blackboard. The online discussion was followed by a threaded question, which helped students to reflect on what they had learned (Everett, 2000 and Palloff & Pratt, 1999). Each discussion group was scheduled for the Monday evening before an exam. The purpose was to:

1. Organize teams and discuss team progress.
2. Answer questions before the exam.
3. Run a threaded question, to which each student must contribute.

The instructor started the discussion group and remained online for the first 60 minutes. Then the instructor posed the threaded question. The duration of the threaded question depended on

the students' response time. The threaded question was graded and the score was added to the subsequent exam.

Exams

On Wednesday at 6:00 p.m., each exam was announced by email and posted to the course web site. Students were required to submit their answers by 1:30 p.m. the following day. They did so by attaching the answer file to email or by FAX. FAX was the most common method because each answer usually required computer output, graphs and/or diagrams which were difficult to send electronically.

Case Study

Four teams of four to five students each were organized to work on a complex, time demanding case study. This cooperative learning technique used small groups of students working together to maximize their own and each other's learning experience (Johnson & Johnson, 1996).

Originally, the teams were organized by geography. However, since the teams in the main campus city had face-to-face contact with the instructor, they had a distinct advantage over the others. Therefore, the teams are now geographically dispersed. Each team is assigned at least one student living in the city of the main campus. Thus, students must converse by email, electronic conferencing, phone, and/or FAX. Occasionally, they traveled up to 100 miles to meet face-to-face. The instructor did not encourage face-to-face contact; but, if the distances are manageable, it happened.

The content of the course was structured to manifest the definable relationship between the IS and Operations departments. The literature and the course's case study illustrated that relationship (Boykin, Martz, & Mensching, 1999). Students analyzed a business problem, implemented a solution to the problem, and then operated the system. The case itself was a real-world example of *Material Requirements Planning*, where the system supported the master schedule by generating timely shop and procurement schedules. Students used computer software to set up appropriate data files, prepare material and capacity plans, and update those plans as they rolled forward through time.

Implementation

Systems and Operations became operational Spring Semester 1998. At the beginning of Spring Semester 1998, thirteen students signed up for the pilot course; nine students finished and earned a grade. From the outset, there was a great deal of confusion, primarily because the technical details and the course itself were still undergoing development. Consequently, the course got off to a slow start; thus, it was completed two weeks late. The pilot course uncovered many problems, most of which concerned technology, course content, and method of delivery. These problems were resolved as soon as they surfaced. As a result, the subsequent courses ran relatively smoothly and were completed on schedule.

Technical Lessons Learned

With the original course management system the technology team created a central computer account, installed Microsoft software on faculty computers, and burned CDs for students. The original CDs were loaded with Microsoft Internet Explorer and NetMeeting to make it easy for students to upgrade their applications to the current versions. With the Blackboard course management system, this is no longer a necessary process because it supports a broader range of computing platforms. The team assembled welcome packets; each packet included a cover letter from the instructors, syllabus, and case study. It was sent to the students, along with their assigned usernames, passwords, and instructions on how to change passwords. Each student was given the opportunity to post a picture and personal profile on the course web page. The original environment required the technical team to create pages for the students, whereas the Blackboard system enabled students to upload pictures and create a personal profile by themselves. Practice sessions were scheduled to teach students how to use the online learning environment to reduce the amount of problems during the delivery of the course associated with learning the technology (Everett, 2000 and Lim, 2001).

During the pilot course, several important technology problems emerged. Since then, the most pressing problems have been resolved. The problems were:

- 1) Registration – Student registration kept changing, almost on a daily basis. As a result, some students got their packets late. Moreover, some of the CDs were flawed and the accompanying instructions were hard to understand. As a result, students got CDs that

would not install, as well as instructions that did not explain why. Therefore, in the beginning, students were confused and complained accordingly. To solve the problem, registration in subsequent sections was closed one week before classes began.

- 2) Software Installation – Some students could not install the software, either because their computers were not powerful enough or were Apple rather than IBM compatible. These students either dropped the course or found access to computers with sufficient resources to run the software. To solve the problem, students are now required to have access to a Pentium class IBM compatible computer.
- 3) Written Instructions – Many students just did not understand the written instructions; they needed individual attention from the technology team. A member of the technology team was assigned to contact each and every student. In this way, students' problems were ascertained and fixed.
- 4) Platform
 - a) NetMeeting Video – Using video during NetMeeting was unsatisfactory. Video is a multimedia feature not available to every student. The picture took up space on the screen, was distracting and unproductive, and consumed valuable bandwidth.
 - b) NetMeeting Audio – Using audio during NetMeeting also was unsatisfactory. Voice communication was only possible between the instructor and one student at a time. It was distracting because the instructor could not respond to audio and pay sufficient attention to the chat box at the same time. The audio time delay of 3-seconds or more was distracting as well.
 - c) Software Demonstration - Because of the time delay, it was difficult to use NetMeeting to demonstrate the software programs. While the instructor was looking at and explaining the most recent frame, students frequently were looking at a previous frame.
 - d) Chat – Since the chat was the only feature feasible to use in NetMeeting, the course switched to a java text-based synchronous chat tool so that students would not have to install NetMeeting. The Blackboard course management system also has a java synchronous chat tool.
 - e) Adopting Blackboard – The Blackboard course management system was adopted to alleviate the platform problems and to reduce the amount of technical support required.

Blackboard was powerful enough to meet the needs of the course and replaced several single-purpose software programs

Course Related Lessons Learned

Systems and Operations was a natural for team teaching. Thus, the pilot course was taught by two instructors. However, team teaching was too resource intensive; therefore, all subsequent courses were taught by a single instructor who was qualified to teach both information systems and operations management.

During the pilot course, the instructors encountered several nuisance problems. Since then, the most pressing problems have been resolved. The problems were:

1. The custom text was inadequate for two reasons. First, it renumbered the pages from the original texts. Thus, when paragraphs, figures and tables were cited, the page numbers were meaningless. This was true for pages cited in the table of contents and indexes as well. Second, the custom text was printed in black, white, and shades of gray. Graphs and diagrams originally illustrated in color were difficult to interpret; pictures were unattractive. The School was contractually obligated to keep the custom text for two years. After that, it was replaced.
2. In the beginning, students were organized by geography intentionally (i.e., students from the same location were put on the same team). This was a mistake because some teams became more concentrated than others. For the more dispersed teams, face-to-face contact was impractical. Moreover, some students resided close to the parent School; thus, they enjoyed face-to-face contact with the instructors. Theoretically, face-to-face opportunities should not matter, but in practice they do. Therefore, to level the playing field, the students were deliberately separated by geography with each team having one member living near the School.
3. Some students resented having to FAX tests and case study materials. Their primary objections were lack of convenience and cost. Although these were valid arguments, the FAX was an integral part of the course's communication package.

4. Team members had a natural tendency to work together when they should have been working alone. Take-home tests allowed students to compare answers and/or to divide the workload. There was no way to police their work habits or to administer conventional exams. To solve the problem, students were informed that tests would be scrutinized for duplication. Duplication was penalized.
5. During group discussions, the instructors could not keep up with the traffic. The questions and responses were so rapid that the instructors usually fell 5 to 10 minutes behind. As a result, some questions were ignored while other questions were answered inadequately or even erroneously. The problem was partially resolved by carefully structuring the sessions rather than allowing free dialog.

Conclusion: Assessment and Effectiveness

The educational objectives of relevance and quality have been the primary focus of the process employed by the School to reinvent its foundation program. Prior to the implementation of *Systems and Operations*, students entered the professional program courses (600-level) with widely varied backgrounds. Only one of the local colleges offering courses in information systems and operations management was AACSB International accredited. Even there, however, few off-campus students could take courses since none were available at night. Correspondence courses represented a poor substitute for effective learning and students frequently voiced dissatisfaction with this option. As one student stated:

“My experience in the two-way, interactive TV classes in the MBA program was not duplicated in the correspondence class I took to fulfill my prerequisite course requirement in information systems. The correspondence class was completely devoid of any real world experience that could have been shared between the instructor and the student in the interactive classroom settings that are possible today with the use of technology.”

Systems and Operations was not conceived of as just another Internet course. The School carefully evaluated options to outsource some of the high maintenance aspects of distributed/distance delivery (e.g., email correspondence with students, web page updates, etc.),

but dismissed this as it wished to maintain the closest contact possible with students in order to continuously improve its course offering. At the close of each semester, the director of the off-campus program contacted students and requested a frank assessment of the experience. The course design team evaluated these assessments, and improvements in content, organization and/or presentation were pursued in subsequent offerings. The process worked, and in the view of some students the benefits were immediately apparent:

“Initially, I was apprehensive about taking a course over the Internet, but the interaction between fellow students in the Discussion Forums created an environment where I actually learned from them similar to a physical classroom. In fact, I found more dialog between students in the Internet courses than in most classroom settings I have experienced.”

“What made Systems and Operations unique was that the techniques used to teach the material accommodated diverse learning styles. For example, I’m more of a kinesthetic learner so I loved clicking away on my keyboard using the different Internet tools (e.g., chat rooms, threaded questions, etc.). At the same time, the visual learners enjoyed the textbook and spreadsheets used in the class and the auditory learners got a lot out of the small group meetings. The varied and creative teaching techniques employed in this class made learning easy for all of us.”

The third objective of reaching a geographically dispersed audience of students with a convenient set of foundation program courses was met from the onset with implementation of the Internet model. One student who completed all five foundation courses on the Internet had this to say:

“I hope more off-campus MBA classes go online; it’s a godsend. I take my books with me everywhere I go to sneak in a few minutes reading here and there. Lots of people ask me where I’m studying and they are very intrigued by the online concept for the same reason – save time commuting.”

At the end of each semester's offering of *Systems and Operations*, a formal course evaluation instrument is administered (See Table 2: Course Evaluation). The means for the 5-point likert scaled questions are reported. The first column shows the average ratings for the first four years of the course using the home-grown platform. The last column represents the ratings for the one year on the Blackboard platform. The scaled responses to the questions help pinpoint a relative measure of success with the approach, and the evaluations for the classes taught with the home-grown platform are comparable to the student ratings for the course taught with the Blackboard platform.

TABLE 2		
SYSTEMS & OPERATIONS INSTRUCTOR / COURSE EVALUATION		
Evaluation Questions	Home-Grown	Blackboard
	Platform	Platform
	Mean	Mean
LOW = 1 HIGH = 5		
Overall, how would you rate the instructor on this course?	3.40	3.50
Overall, how would you rate the course content?	3.80	3.50
NOT AT ALL = 1 DEFINITELY = 5		
Goals were clearly stated	3.50	4.25
Goals were met	3.70	3.75
Textbook was useful, relevant	3.45	3.50
Student evaluation (grading) was fair	4.20	4.75
Instructor commanded attention	4.10	4.50
Instructor provided a supportive learning environment	3.45	3.75
Instructor was familiar with material	4.40	4.25
Instructor was helpful	4.10	4.25
Instructor was motivating	3.30	3.75
Instructor was available for consultation	4.20	4.25

The course evaluation results along with the open-ended feedback received from students were utilized to make modifications to the course pedagogy over time. The formal assessment process has enabled the School to develop an effective learning environment for *Systems and Operations* as well as the other courses in the MBA Foundation Program. This program incorporates innovative distributed learning techniques to provide access to learning opportunities for geographically dispersed working professionals. The School continues to draw on lessons learned from participating in distributed learning activities to better serve its constituents.

References

- APICS Dictionary*. (1998) (9th Ed.). Falls Church, VA: American Production and Inventory Control Society, Inc.
- Boykin, R. F., Martz, W. B., and Mensching, J. M. (1999) The integration of enterprise information systems in the operations management curriculum. *Journal of Computer Information Systems*, 39 (4).
- Bruneau, C. L., and Herron, T. L. (1999) Approaches to MBA distance education: Serving a widely dispersed population. *Business and Behavioral Sciences*.
- Chickering, A. W. and Ehrmann, S. C. (1996) Implementing the seven principles, technology as a lever. *AAHE Bulletin*, 49 (2).
- Dede, C. (1996) Distance learning—Distributed learning: Making the transformation. *Learning and Leading with Technology*, 23 (7), 25-30.
- Effective Strategies for the Online Classroom*. San Francisco: Jossey-Bass.
- Everett, D.R. (2000) Taking Instruction Online: The Art of Delivery. *Computers in*
- Graves, W. H. (1997). Free trade in higher education: The meta university. *Journal of Asynchronous Learning Networks*, 1, (1).
- Johnson, D. W. and Johnson, R. T. (1996) Cooperation and the use of technology. *Handbook of Research for Educational Communication and Technology*, D. H. Jonassen Ed., New York: Macmillan.
- Lim, C. K. (2001) Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *The American Journal of Distance Education*, 15 (2), 41-51.
- Locatis, C. & Weisberg, M. (1997) Distributed learning and the internet. *Contemporary Education*, 68 (2), 100-103.
- Meredith, J. R. and Mantel, S. J. (1995) *Project Management: A Managerial Approach* (3rd Ed.), New York: John Wiley & Sons.
- Oblinger, D. G. and Maruyama, M. K. (1996) *Distributed Learning*. Boulder, CO: CAUSE: The Association for Managing and Using Information Resources in Higher Education. (CAUSE Professional Paper Series No 14).
- Palloff, R. M. and Pratt, K. (1999) *Building Learning Communities in Cyberspace: Serving a widely dispersed population*. *Proceedings of the American Society of*

Social studies Journal, 8 (2).

Tiessen, E. L. and Ward, D. R. (1997) Collaboration by design: Context, structure, and medium.

Journal of Interactive Learning Research, 8 (2).