Journal of Information Technology Impact

Distance Education Contingency Planning: Hybridization in Disaster Recovery

Deborah Buell[1]
Cy-Fair College
Texas, USA

Merrilee Cunningham[2], Erin Hodgess[3], and Ruth Robbins[4]
University of Houston Downtown
Texas, USA

Abstract

A review of collegiate strategic, contingency and disaster recovery plans suggests that a larger vision and expanded distance education program is needed to meet the requirements of turbulent times, a changing student population, and expanded computer literacy. This article sets out guidelines for creating a communication plan and instructional mechanism for continuing learning when changing circumstances occur and disaster strikes. Those guidelines help a university move towards a systematic contingency hybridization of courses in an emergency.

Introduction

Universities, community and four-year colleges, perhaps especially those that function in multistory buildings, have been challenged to learn and adapt to unexpected circumstances and disasters that may impact the traditional teaching and learning process. Since terrorism, epidemics, and bad weather are facts of modern life, procedures that lead to the minimizing of downtime and damage done to university programs and students attempting to gain training and degrees should also be set in place. Traditional emergency procedures are being reassessed for their effectiveness in response to situations that would keep students from face-to-face classes much longer than imagined before Hong Kong's universities had to deal with the SARS epidemic. While some threats would suggest that a university is more likely to be cordoned off than evacuated, others would require long term evacuation of classroom facilities. Universities are attempting to identify their critical assets -- those that affect the effectiveness of their delivery of services--while attempting to discover what they cannot do without if a university is to function, even at a reduced level without those face-to-face classes. Perhaps too obvious to discuss here, one of the first rules would be that the individuals that set policy would not be exactly the same essential figures that carry out these policies for emergency response actions. Another, perhaps less obvious aim might be discovering potential response resources that a university administration may already have in place but does not yet either recognize or use as assets in an emergency and it is this that is the subject of our paper. Now that anti-diasporic directives to stay put in all cases except for biological and bacterial emergencies have been discredited as a method for dealing with emergencies, we would like to makes some suggestions relating to studying from

home, teaching from home, and emergency hybridization of collegiate curriculum given the presupposition that at least some face-to-face teaching has already become more of a desired good than an actual immediate necessity.

Strategic, Contingency and Disaster Recovery Plan

In the past, when disasters, catastrophic events and health quarantines occurred, the real work of higher education was put on hold. Even now, on-campus classes are disrupted and teaching stops unless there is a mechanism in place to allow learning to continue through programming scheduling alternatives. It is our contention that the mechanism for carrying on the learning process -- the distance education program -- is already in place at the majority of higher education institutions in the U.S. (Waits & Lewis, 2003). What is needed is a kind of connect-the-dots application and we call this application, "contingency hybridization." Contingency hybridization is a new term that we're using to describe the mechanism created by the interface of hybrid course capabilities with the distance education strategic plan, campus contingency and disaster recovery plan and distributed learning centers. The hybrid course format is defined as an on-campus course that has a virtual or online component. Typically, the hybrid course format uses the Internet plus an electronic learning community feature to provide online communication supplements, course management aids and course content aids (Poindexter, Heck, & Ferrarini, 2000).

The information technology infrastructure that will enable contingency hybridization is already in place. Hybrid courses, web servers, course management software packages (WebCT, Blackboard, etc.) and other collaborative software programs are currently in use at many colleges and universities. Making contingency hybridization happen requires rethinking how we use the current infrastructure and creating a comprehensive mechanism and communication plan that will enable teaching and learning to go on during emergencies and campus shutdowns. This development process starts with connecting the distance education program and strategic plan.

The Distance education program is an integral part of the collegiate strategic plan. The typical distance education strategic plan outlines the student service mission, degree program offerings and curriculum delivery strategy. Completely separate except for both perhaps being components of a collegiate teaching and learning website, the disaster plan has been a file retention center. The student service mission has traditionally focused on providing access to educational programs to student populations who cannot attend on campus classes due to work, family, lifestyle, physical disability, distance or other personal reasons. Even then, there is often a preconception that on-line or hybrid courses are not as successful with students as "talk and chalk" courses traditionally have been.

A review of comparison studies between on-campus courses and courses delivered in ITV (interactive television) or online format shows mixed results. In many cases there is no significant difference between the on-campus, traditional lecture course and the distance education course regardless of the technology delivery method (Russell, 2003a). In contrast, recent studies are showing a significant difference between the traditional and the distance education course (Russell, 2003b). More recently, published studies on courses that are delivered in hybrid format have focused on how the course was organized, designed and administered.

Studies that focus on the effectiveness of the hybrid course format are being conducted but have not been published yet. Thus, we decided to run some preliminary statistics on our own courses. The following statistics will be our only justification for on-line learning to be expanded for contingency hybridization as we ask two questions:

1. What will hybridization of face-to-face courses do to student success ratios?
2. What should we expect in terms of growth in enrollment?

Historical Justification for Expanded Online Services

When we consider the U.S. total fall collegiate enrollment since 1947, we see some interesting trends. First, there is an exponential rate of growth over those years. In 1947, there were 2.34 million people in total enrollment, while in 2000, there were 15.31 million. This amounts to a 557% overall increase. This can be seen in figure 1.
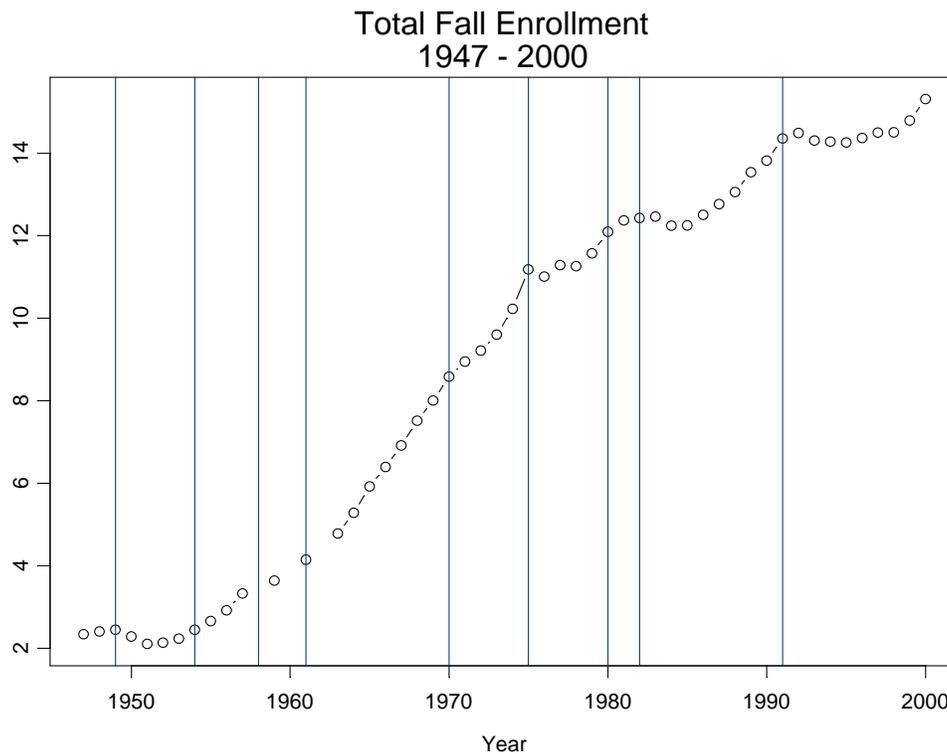

Figure 1. Collegiate enrollment since 1947

The circles indicate the enrollment for that year, while the vertical lines indicate years in which there were troughs in the U.S. business cycles. Notice that in every trough year, enrollment is either at a peak or increasing. The graph is a concrete demonstration of the concept that in a poor economy, which many disasters would turn into an even poorer economy, people return to update their education level.

The average annual rate of change in enrollment is about 3.6% for the 53-year period. In other words, if the enrollment grew at the constant rate from 1947 through 2000, that constant rate would be 3.6%. We then calculated a simple percent change for every year in the enrollment data. We found that the percent increase for all but one of the trough years was greater than 3.6%. These findings are another case for "poor economy, more students" theory and the SARS epidemic has shown us what economic devastation can occur when a country is quarantined, even briefly.

Many of these students are adults returning to higher education. Even within the historical data set, we see large increases in post-war years, as in 1953 and 1954, from the Korean War, in 1974 and 1975 from the Vietnam War, and in 1991 from Desert Storm. These adults have been in the armed forces or in the workplace, and are technologically savvy. They expect the latest in ideas that will support their full-time employment. Many of the new students, employees with families, do not have the time resources of traditional students and hybridization accommodates their needs.

Statistical Evidence of Effectiveness of Online Courses

Ignoring such a need would be preferable to teaching ineffective courses. We will present some results of online courses compared with face-to-face courses and ITV courses at the University of Houston Downtown.   In the spring of 2002, a pilot version of a first semester Business Statistics class was presented. We compared the average grades in the online class to those of an ITV class. Using a t-test of 2 means, we found that there was no significant difference between the grades in those classes (p-value = 0.29). We analyzed data again in the spring of 2003, and much to our surprise, we found that the online grades were significantly higher than their ITV counterparts (p-value = 0.01). These results were quite gratifying, because statistics is difficult to teach through any medium. We believe that the success rate was due to the high level of class interaction and communication as demonstrated by an array of discussion board postings and a variety of homework assignments. We also reviewed data from two semesters of a Computer Information Systems class. In this instance, we compared data from an online class and a face-to-face class. Using the same kind of test, we found that there was no significant difference in the fall of 2002 class, with a p-value of 0.69. We ran a comparison again in the spring of 2003, and found that there was no significant difference between the classes, with a p-value of 0.23 (NBER, 2002, Table 172, p. 210). The on-line courses were just as successful as face-to-face courses. No doubt, this speaks highly of the instructor's support of her students and the motivation level of those students, but it also justifies the course delivery system. Despite these findings that suggest that on-line courses work as well as ITV courses with face-to-face components, there may be contingency reasons for significant continued investment in ITV.

Others have noted that on-line courses effectively meet student learning goals and in at least one case, a university responded with massive hybridization: At the City University of Hong Kong, virtual private networks (VPN) were installed to keep the learning cycle intact during the SARS epidemic. Many Hong Kong corporations are following this same track. However, both students and employees need to have personal computers at home for VPN access (Perez, 2003). The infrastructure was there to turn face--to-face courses into hybridizations. Goal 4 of Texas

Tech's Distance Learning Strategic Plan links the collegiate planning process with the goal of reaching students and meeting their learning needs. Specifically, Goal 4 of Texas Tech's strategic plan describes its student service mission as: "Provide technology infrastructure, programs and assist faculty, departments and colleges in meeting their distance learning goals (Texas Tech University, 2003)." The administrative goals for the distance education program focus on using the technology infrastructure and curriculum to reach larger student populations, increase enrollment and maximize use of the campus physical plant. Higher education institutions have been successful in meeting these goals as shown by the profitability and continued growth in distance education course offerings (Boas, 1999), but are we ready to put in place the kind of virtual private networks used by City University of Hong Kong?

More recently, a number of higher education institutions have expanded the traditional mission and role of the distance education program to include provisions for disaster recovery and contingency planning. In general, contingency planning and disaster recovery plans are divided into operational roles and functions related to restoring the campus physical plant and information technology infrastructure back to working order. These roles and functions are routinely broken down into the following parts: communication plans and detailed procedures and activities related to restoring the campus physical plant and information technology infrastructure (network, electronic mail, computer files and network security). The university/college President sets the contingency and disaster recovery plans in motion by declaring an emergency situation, but few universities are ready to convert all their courses to hybridization. The responsibility for implementing disaster recovery/contingency plans resides with the physical plant, police, information technology and instructional technology departments, but many instructional technology departments would be unable to convert to even on-line courses on a massive level because they have no computer-based learning and teaching centers, no contingency plan with communication scenarios, and too few websites to direct the students.

The University of Arizona provides an excellent example of a communication plan as part of their contingency and disaster recovery plan (University of Arizona, 2003), offering an extensive disaster recovery website with links to scholarship by academic discipline. The University of Toronto's computing and Networking Services Plan has a truly outstanding plan for Information Systems Recovery, including selecting project teams (University of Toronto, 2002), and establishing a Steering Committee. Michigan State University's Disaster Recovery Plan sets out the training program for disaster recovery by conducting a Disaster Recovery Planning Seminar twice a year. Michigan State also makes a Digitized Disaster Recovery Planning Video available on site; however, most of this planning deals with data files, software, inventory lists, forms, and "selecting an alternate facility (Michigan State University, 2003)." The provisions of collegiate strategic, disaster recovery and contingency plans are adequate for addressing the needs of periodic campus closings due to short periods of inclement weather or other disasters. However, they generally fail to address the challenges posed by frequent and on-going disasters and events that may shut the campus down for a prolonged period of time or for the possibility that there is no alternative facility. They fail to use their computer learning and teaching centers as communication hubs and information boards for massive hybridizations. The plans also have not kept pace with the changing student population and enrollment trends.

Another option for disaster planning is the use of immersive video-conferencing. There are special classrooms set up in several universities, and the speaker has a live connection with each site. This process has been used very successfully at Duke University, Ohio State University, the University of Arizona, and the University of Pennsylvania. If a problem occurs, the speaker could access his or her students from another site. The lecture could be videotaped and made available to the students. The price of this kind of program is steep, but under special circumstances this could provide an excellent resource for disaster recovery (Olsen, 2003).

The Need for a New Role, Mission and Plan

The times that we live in require a new role, mission and plan for the distance learning program. This new role and mission requires a larger vision for distance education and this larger vision inherently means taking the "distance" out of the educational program. It requires the creation of a communication plan and electronic or virtual learning component for traditionally on-campus curriculum so that teaching and learning may continue during periods when the campus may be shut down or the student is prevented from attending class. The distance education program is the most logical area to create a hybrid learning program that will provide an online link for campus classes that will flex to changing circumstances and needs and a ready website for a communication center would be useful.   A contingency hybridization plan needs to take shape in at least some urban university settings.

Developing a hybrid or electronic learning component for campus classes is not just a good strategy when disaster strikes. It's a strategy for a variety of seasons and reasons, especially, reasons that relate to a changing student population. You don't need a SARS epidemic to make this plan useful. A student who is transferred, a student who is in the hospital from an automobile accident, a student who has a baby five weeks before class is over would find this contingency plan useful.   Non-traditional students must juggle multiple roles and multiple time priorities which mean that they must be well organized and manage their time and energy efficiently. Even traditional students (18-22) are working adults and often juggling multiple roles and priorities and could use material made ready for hybridization programs.

These realities are reflected in student enrollment trends where students commonly enroll in more than one academic program on one or more campuses. Students also may divide their course load into a mix of on campus classes and distance classes (delivery modes may vary from ITV to online or both) (Waits & Lewis, 2003). This fact shows that the traditional view of dividing the student population into an "on-campus" and distance learner is obsolete. Population demographics and enrollment trends tell us that the non-traditional student majority and traditional student minority enroll in both on-campus and distance classes. Young (2002) reports that about 60% of students enrolled in online classes are also taking traditional classes on campus.

Creating a virtual or electronic learning component for on campus classes should not just be a knee jerk response to the inadequacies of the current strategic plans. The complexities and time required from faculty, administration and instructional support staff to implement such a program requires a well thought out plan. The administration, faculty and staff must work together to create communication protocols, instructional ground rules and scaled course models (course plans that vary by the level of technology used based on the course content and other factors) to

implement a quality program. Sets of pilot courses will need to be created and tested in a progressive plan to phase in the implementation of hybrid courses across the curriculum. Faculty and staff reward structures must be revised to acknowledge the time, effort and expertise required to develop and publish new course models. Precedent for developing and implementing hybrid course models and curriculum already exists. Community colleges and four year colleges and universities have already been moving toward such a program. The University of Central Florida (UCF) is an example of this movement toward hybrid education (Young, 2002). UCF offered 100 hybrid courses that met half the time on campus and half the time online as a way to meet student needs and to reduce the university's need to rent extra classroom space (Young, 2002). This direction has been taken because on campus students want to have access to and use the same technologies that their distance counterparts have. What makes the recommendations in this article different is that distance or information technology has not been seen and used as an implement for contingency planning and disaster recovery.

Conclusions and Recommendations

The campus contingency and disaster recovery plans should be revised to set up a structure, communication plan and procedure that provides for continuing the teaching and learning process when inclement weather, prolonged campus shutdown or other disaster strikes. The City University of Hong Kong has provided us with one potential model. These plans should be set up and published on the campus web site and linked to every syllabus in every course, using a WebCT, Blackboard, or other course management program. Changes to these plans should be made through grass roots efforts across the campus with representatives from faculty, staff, administration and students, and, if in place, a teaching and learning center with an on-line presence and a distance education section. All of these efforts should inform the university/college mission, purpose and vision. Of course, it goes without saying that a faculty would have to be trained to deliver elements of their classes from home, but in so many situations, faculty members who teach hybrid courses and/or e-courses already are.

All of the recommendations and strategies taken together have the student service and continued learning goal at the center of planning. We believe that implementing a larger distance learning program plan with contingency and disaster recovery components centered on student learning is much more than a short term solution. In the long run, creating and implementing such as strategy will provide better student service, a stabilized and more successful learning continuity, course enrichment, and value added to collegiate degree programs even if they never are needed in an emergency.

References

Associated Press. (2003, April 23). *China Closes Beijing Schools Due to SARS*. Retrieved June 5, 2003, from ABC News Health Online Web site: http://abcnews.go.com/wire/Living/ ap20030423_802.html

Boas, G. (1999). *Nine out of ten distance learning programs in higher education operate at a profit, according to a new survey report* . Retrieved July 11, 2003, from PR Web (Primary Research Group, Inc.) Web Site: http://www.de.ttu.edu/content/asp/strategic_plan.asp

CNN. (2003, May 22). *Bomb explodes in Yale law school*. Retrieved June 5, 2003, from http://www.cnn.com/2003/US/Northeast/05/21/yale.explosion/index.html

FEMA. (2003, July 23). *2003 Federal Disaster Declarations*. Retrieved June 11, 2003, from http://www.fema.gov/news/disasters.fema

Michigan State University. (n.d.). *Disaster Recovery Planning*. Retrieved June 5, 2003, from http://www.drp.msu.edu/about_the_site.htm

NBER. (2002). *Digest of Educational Statistics, 2002*. Retrieved June 5, 2003, from National Bureau of Economic Research Web Site: http://www.nber.org/cycles.html

Olsen, Florence. (2003, July 4th). Videoconferencing with Some Life to It. *Chronicle of Higher Education,* p. 24.

Perez, Bien. (July 15, 2003). Hong Kong Firms Step up IT Spending, *South China Morning Post,* Technology Section, P. 1.

Poindexter, S. E., Heck, B. S., & Ferrarini, T. H. (2000). Hybrid Courses: Determining the Effectiveness of Using the Internet. *Educational Resources Information Center (ERIC), ED 456801,* 1-9.

Russell, T. J. (2003). *The No Significant Difference Phenomenon.* Retrieved July 18, 2003, from TeleEducationNB Web Site: http://teleeducation.nb.ca/nosignificantdifference/

Russell, T. J. (2003). *The Significant Difference Phenomenon.* Retrieved July 18, 2003, from Tele Education NB Web Site: http://teleeducation.nb.ca/significantdifference/

Texas Tech University. (n.d.). *Distance Learning Strategic Plan*. Retrieved June 5, 2003, from http://www.de.ttu.edu/content/asp/strategic_plan.asp

Tucker, J. B. (2002,Winter Edition). *BIOTERRORISM: What the Anthrax Attacks Should Teach Us*. Retrieved June 5, 2003, from Hoover Digest Web Site: http://www-hoover.stanford.edu/publications/digest/021/tucker.html

University of Arizona. (2003, May 7). *Appendix C: IT Disaster Recovery Plan*. Retrieved June 5, 2003, from http://www.asu.edu/emergency/bcp/docs/IT_DR_Plan.pdf

University of Toronto. (2002). *Disaster Recovery Planning-Project Outline*. Retrieved June 5, 2003, from http://www.utoronto.ca/security/drp.htm

Waits, T., & Lewis, L. (2003). *Distance Education at Degree-Granting Postsecondary Institutions: 2000-2001* (NCES 2003-017). Washington, DC: U.S. Government Printing Office. Retrieved July 18, 2003, from U.S. Department of Education, Institute of Education Statistics Web Site: http://nces.ed.gov/pubs2003/2003017.pdf

Young, J. R. (2002). Hybrid Teaching Seeks to End the Divide Between Traditional and Online Instruction. *Chronicle of Higher Education, 48*(28), A33, 2p, 1c. Item Number: 664130. Retrieved July 16, 2003 from Academic Search Premier.

---

[1] Dr. Deborah Buell is an Instructional Designer in the College and Corporate Training & Development Center at Cy-Fair College. She can be reached at 9191 Barker Cypress Road, Room 155-F CENT, Cypress, Texas 77433-1383 USA. E-mail: Deborah.J.Buell@nhmccd.edu; Phone: 281.290-5976 or FAX: 281.290-5266.

[2] Dr. Merrilee Cunningham is an Associate Professor in the English Department at University of Houston Downtown.   She can be reached at # 1 Main Street; Houston, Texas 77002; USA ; Email cunninghamm@uhd.edu; FAX 713-226-5205.

[3] Dr. Erin Hodgess is an Associate Professor of Mathematical Sciences in the Computer and Mathematical Sciences Department at University of Houston Downtown. She can be reached at #1 Main Street; Houston, Texas 77002; USA; Email: hodgesse@uhd.edu; FAX: 713-221-8086.

[4] Dr. Ruth Robbins is a Professor of Computer Information Systems in the Finance, Accounting, and Computer Information Systems Department at University of Houston Downtown. She can be reached at # 1 Main Street; Houston, Texas 77002; USA. Email: robbinsr@uhd.edu; FAX: 713-226-5238.

Page left blank