

Web-Based Education

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Technological change, which not only permits new activities but makes those new activities superior in many important ways over the previous method of operation, creates long lasting innovations in society. Web-based education is one of those innovations (Franklin and Peat, 2001).

Why is the remarkably fast growing innovation of web-based education important to our world? Firstly, it is radically growing in the first world nations of the world, especially in the United States (Barker, 2002). This alone means that it will likely grow in other nations in the world, as this innovation dominates education at all levels. For example, one of the leading software companies in this innovation is Blackboard, which, at the time this article was written, was five years old. It reached the point of profitability in its fifth year with 26 states using its product. Some states like Massachusetts and Louisiana have the product available for all public schools from kindergarten to the Ph.D. level. Universities like Princeton use Blackboard for every course taught in the university. WebCT, which is the other leading platform, dominates the United Kingdom, Australia, much of Western Europe, and South Africa.

Secondly, teachers at all levels can merely post their syllabi on Blackboard but some have radically changed their whole method of teaching so that the class venue for the teacher and the student becomes the computer. The classroom now is a "virtual learning environment." Learning is no longer bound by space and time (Franklin and Peat, 2001). To use a metaphor associated with the past, the traditional classroom has become the expensive and difficult to handle as the rolled parchment manuscript when

the printing press innovation was implemented. Web-based education has become the cheaper and superior printed book of the modern era.

Before proceeding further, a brief discussion of vocabulary is necessary to provide clarity in this article. The literature tends to use the following words interchangeably: online education and web-based education; computer assisted learning, web assisted learning and web mediated learning; virtual learning environments, online courses, and web-based courses. We are using two terms in a more specific manner. Online education means the use of an integrated and global accessible collection of teaching materials for the attainment of course objectives (Barker, 2002). These teaching materials could be used to augment a campus based traditional class or for a web-based course. Web-based education means the most extreme form of online education that uses streaming videos and the more advanced functionalities available in educational software and where there is no actual face to face contact between the teacher and the student.

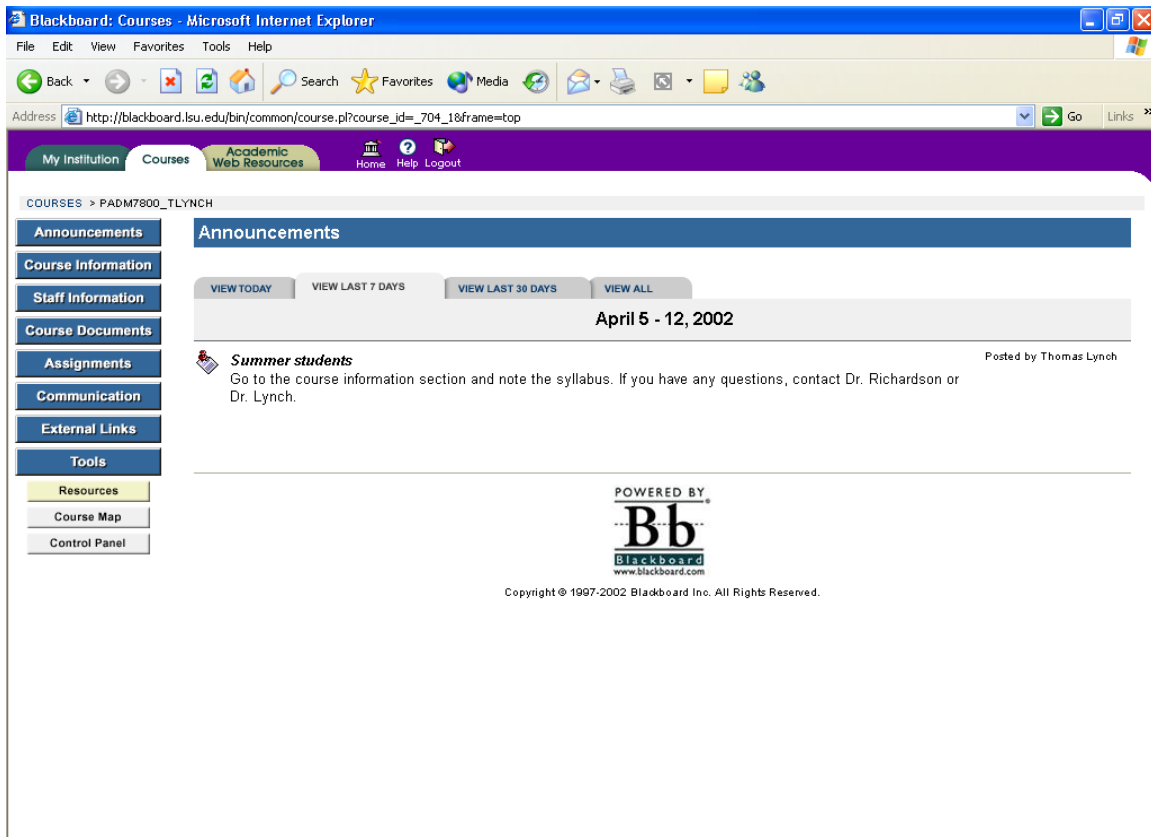
This article will address several key topics. The first section will discuss what web-based education can mean in the educational environment. The second section will discuss the practical implications of web-based education to society. The third section will discuss the frequently cited criticisms against web-based education. The fourth section will discuss the barriers to this innovation. Finally, the authors will offer some conclusions that hopefully will provide useful insights to the readers.

WHAT WEB-BASED EDUCATION CAN BECOME

For those not familiar with web-based education, it is a big new mystery. This section will address the mystery and readers familiar with it might just skip this section. In this article, we use examples from the Blackboard product but our purpose is not to promote that product but merely cite illustrations that will be more comfortable to the largest readership possible. Illustration one provides an example of the course home page in Blackboard using Internet Explorer to access it.

On the illustration, there is the standard web information from Internet Explorer. However, students or the professor could have also used Netscape to open the web page. To access the site, the person will type in the web address such as

ILLUSTRATION: BLACKBOARD COURSE PAGE



The screenshot shows a Microsoft Internet Explorer browser window displaying a Blackboard course page. The address bar shows the URL: http://blackboard.lsu.edu/bin/common/course.pl?course_id=_704_1&frame=top. The page features a purple navigation bar with links for "My Institution", "Courses", "Academic Web Resources", "Home", "Help", and "Logout". Below the navigation bar, the course path is "COURSES > PADM7800_TLYNCH". A left-hand sidebar contains a menu of course-related items: "Announcements", "Course Information", "Staff Information", "Course Documents", "Assignments", "Communication", "External Links", "Tools", "Resources", "Course Map", and "Control Panel". The main content area is titled "Announcements" and includes tabs for "VIEW TODAY", "VIEW LAST 7 DAYS", "VIEW LAST 30 DAYS", and "VIEW ALL". A single announcement is displayed, dated "April 5 - 12, 2002", with the subject "Summer students" and the text: "Go to the course information section and note the syllabus. If you have any questions, contact Dr. Richardson or Dr. Lynch." The announcement is attributed to "Thomas Lynch". At the bottom of the page, there is a "POWERED BY Blackboard" logo and a copyright notice: "Copyright © 1997-2002 Blackboard Inc. All Rights Reserved."

<http://Blackboard.lsu.edu>. If students are seeking access, they must type their unique ID and password. If the professor allows guest access, the guest enters without a unique ID or password but has limited access to the site for confidential reasons, as will become apparent later. Note the navigation banners on the right of the illustration, such as course information, assignments, course documents, and so on. A simple click on one of them calls up the section of material on the frame developed for the web page related to the banner title. For example, the Course Information would typically contain the course syllabus, important dates in the class such as when tests are held, instructions on how to use the discussion board forums, and so on. Assignments might contain exercises and exams. The content of the sections is completely the decision of the course teacher who places the information on the web page themselves.

There are seven important functionalities in web-based education: (1) real time announcements, (2) posting of text, html, spreadsheets, videos, PowerPoint, audio files, (3) real time grade book, (4) external links, (5) discussion board and chat rooms, (6) automated quizzes, and (7) emails to individuals and list serves. For the student, the announcements are on the opening page of the course. The announcements allow the teacher to give the students needed information items, as the course evolves during the semester. The student can view all the announcements or only the most recent as he or she wishes. This is very useful as the announcements are available immediately to the student as the teacher makes the posting. In addition, the teacher has a record of when the announcement was posted and modified. This leaves the student without the traditional classroom argument that “I did not hear the announcement.”

Most new users of online or web-based education use the announcements and the functionality of posting materials. Teachers find that posting their one or more page syllabus useful because the students have it easily available and can print it when they wish or as often as they wish. However, few teachers really take advantage of this functionality. For example, very few post their PowerPoint lecture notes or their lectures on Blackboard.

For beginners, the real time grade book, external links, and email functions are wonderful. Students want their grades posted as soon after the test as possible. With software like Blackboard, they can go to their grade book and see the instructor's grades as soon as they are posted. The added advantage is the software protects the privacy of the student by permitting the student to only see his or her grades. External links provide the student with Internet sources that are particularly important and useful from the teacher's point of view. The email function is very handy as it allows the teacher and student to easily communicate with each other or with the whole class as a group using a list-serve. In addition, there is a drop box capacity, which allows the student and teacher to send files and easily keep track of what was sent and when. This is especially useful for students submitting assignments or faculty returning assignments with their comments.

For the more advanced users, the teacher can use automated quizzes. If the test is objective or uses "fill in the blank" but not subjective questions, the teacher can post the quizzes on the Internet and have the computer grade it automatically. The student goes to the quiz, enters the password for the quiz, and takes either a timed or non-timed quiz. When finished and submitted, the computer tells the students which answers were incorrect, provides teacher feedback on each question, and enters the score in the grade

book. The teacher has the option of allowing the student to retake the exam or not. If security is a concern, the teacher can ask the students to take the online quiz in a controlled computer lab environment in which IDs would be checked and students would not have access to any other materials. The professor can also configure quizzes to have the computer randomly select questions from a large question pool, which also helps discourage cheating.

For even more advanced professors using Blackboard, there is the discussion board / chat rooms. This permits students to interact with the teacher and other students with the computer. Chat rooms require students and the teacher to get on the computer at the same time and then communicate with each other over the computer screen. For those who wish student and instructor interactions, most users prefer the asynchronous discussion board, which is active for a set period of time such as a week. During that time, the teachers and students log-on and record their thoughts on the topic plus the comments of those who spoke earlier. All thoughts are captured on the computer. The advantage of the discussion board beyond the recording of comments is the opportunity given to the students of developing more thoughtful comments over a longer period of time. The activity of the teacher in a given discussion board forum can vary from nothing to strong guidance to keep the students on point and focus their comments.

The most advanced professors can also use software produced by Tegrity, Real Player, Apple's Final Cut, or Microsoft Producer. With this software, professors can record their lectures and post them on Blackboard using streaming video. All of these products allow professors to merge their PowerPoint lecture slides with a video of them lecturing using the slides. The functional advantages and prices of these various products

vary significantly. For example, Microsoft Producer requires a three step operation of preparing PowerPoint slides, capturing the video of the lecture, and integrating the slides with the video. The big advantage of Microsoft Producer is the zero cost for those who own PowerPoint 2002 or higher. In addition, professors can use other off the shelf software to prepare and then post audio and movie files using streaming video.

If the professor posts a combination of video and audio lecture files, students can download the video files at the university high speed computers and the corresponding audio files at home using their phone line connection in seconds. However, if the students download videos from phone line connections, the normal download time for streaming video is much slower and the downloaded video quality is much less. Therefore, the professor is wise to post both video and audio only files of their lectures to maximize the students' ability to review the lectures with minimum frustration.

In these learning systems, the range of functionalities is not just an impressive array of IT bells and whistles. They have been designed with specific pedagogical and cognitive development theories supporting them (Leamson, 2001; Franklin and Peat, 2001; Matuga, 2001). Given this range of functionalities, how can a teacher maximize the use of this software? Frankly, the answer varies according to the creative teaching style of the teacher. The approach presented here assumes an entire online experience and almost no face to face interaction with the teacher or other students. With this approach, students must learn how to operate in a "virtual" environment and thus the teacher must make sure the students have adequate training time in a computer lab. This training is essentially only for students taking their first online class.

The more advanced users of web-based education should integrate the functionalities of Blackboard based on the teacher's course objective and the teacher's judgment on how to best present the material to the students. First, the teacher needs to place on the web site all course material including syllabus, external links, reading materials except the required books, lectures, full instructions on all aspects of the class, quizzes / tests, videos and audio files, and so on.

Secondly, the teacher must consider how to use the quizzes to maximize the learning experience. For example, the teacher can use the quizzes, which the students take, to reinforce the text assignments and lectures. The teacher does this by merely allowing the student to retake those quizzes, which are then called "friendly" quizzes. In addition, the teacher should award a small portion of the total grade for these friendly quizzes in order to insure the students take them. Students will take the friendly quizzes, review the questions and correct answers carefully, and then retake them to improve their grade. The result for the teacher is that the computer takes attendance automatically and the computer re-enforces the key points of the lesson.

Another web-based teaching ploy involves teaching practical lessons such as analytical techniques. The teacher first presents the analytical concept with text and video lectures. Next, the teacher provides practice friendly quizzes so that the students can perform using the analytical technique correctly. Finally, the teacher provides non-friendly quizzes on the technique to insure the students have actually learned the technique. In showing the technique, the teacher might wish to link the quizzes with spreadsheets or other software to make sure the student uses the technique with available software tools.

Thirdly, the teacher should consider how to use the discussion board to maximize the learning experience by reinforcing the text assignments and lectures using in-depth dialogue among the students. For example, the teacher can select six topics that can benefit from group interaction and thought. The teacher places the forum topics on the discussion board and might even break down each topic into sub-topics called “threads.”

The instructor then assigns students to small groups of six and defines three revolving roles during the semester. Four students are discussants, who must address the topic and threads on the forum discussion board for a period of one week. One student is a reporter, who must summarize the forum at the end of the week. Finally, one student is the leader, who must get the students involved, promote active participation, and finally recommend for all other students in the group a forum grade to the instructor following the posted guidelines of the teacher. Based on the experience of one of the authors with discussion boards, the results vary from 20 to 90 comments that range from a few words to a several paragraphs.

The quality of the web-based discussion is much better than normal classroom discussion because the students have an opportunity to present more thoughtful comments. In web-based discussions over a period of one week, introverted students tend to be more active for several reasons. Any speech or social handicap is not apparent and feelings of inadequacy are less likely to inhibit their performance. They have more time to develop their thoughts, adjust them in the context of what is being said, correct them, and then submit them at their pace of thought. They do not have to compete emotionally with extroverts, who tend to dominate the relatively short classroom time.

Students do the normal mid-term, final, and term paper. At least, the mid-term and possibly the final should be a comprehensive take home tests that requires integrative thought and should be submitted via the “drop box.” Students should also submit the term paper via the drop box. An alternative and very challenging assignment to the term paper is to require students to prepare a Microsoft Producer file with PowerPoint and integrated video. An advantage of this approach is that the student learns a valuable new computer skill. One problem with term papers is that students sometimes cheat by paying someone else to write their paper and catching this type of cheating is almost impossible. Another advantage of students preparing a Producer file is that their cheating is made more difficult because they must appear in the Producer file videos.

Unfortunately, student cheating can occur in other ways in both traditional and web-based education. For example, if the teacher uses take home exams, students can merely pay other students to do the course work. To almost insure that cheating does not occur on a test, the teacher can use a cumulative objective final examination that the students must take in a secure computer lab, use a password given just for the test, and have the computer draw the final questions randomly from a large pool of questions. In web-based courses, students can easily pay another person to take their quizzes, tests, and term paper. Having at least one major class product done in a secure setting tends to discourage that form of cheating, as the teacher can easily require a pass in the secured test in order to pass the course.

PRACTICAL IMPLICATIONS

The implications of web-based education are staggering but they are particularly important to public administration education with its many part-time practitioner students. Regardless of the country, most beginning and even upper level public administrators are not properly trained in public administration. Yet, they are typically promoted from a professional expertise, in which they are competent, to one in which they have no or little training or education. Somehow, they must now be *managers* and need a completely different set of skills and knowledge from when they were engineers, accountants, or teachers.

These same people are typically remarkably busy and find going to graduate school very challenging in terms of the time commitment that requires them to balance heavy work load and school assignments with family obligations. Going 15 weeks to graduate school twice a week for a semester is more than a challenge to someone that lives a two hours commute to the nearest university offering the MPA degree, has a forty hour plus work week, and has family needs to fulfill. Thus, the needed education just does not happen or happens at the sacrifice of the job or family.

Web-based education means that time and place are no longer barriers. Any student who can get to a computer can take a web-based class and get an education at least equal to the one offered at a traditional MPA program. In the United States and the other first world countries of the world, the limitation of computer access is not a major problem as they exist at the work place, in public libraries, and often in the homes of the students (Department of Commerce, 2001). The only serious computer problem that does exist is called “the last mile.” This means that most computers are connected to the Internet using phone lines that have limited bandwidth, which results in a slow download

time from the web. For the next decade, the solution for the professor is merely to post large files with video, such as Microsoft Producer files, to the web in two versions. One posting is with high quality video. The other posting is with an audio only option. Then the professor lets the student decide which option is most suitable for them when calling up those files.

In others countries, computer barriers are more significant. For example, free access in libraries does not exist in many places and students are not as likely to have computers at home. As in first world countries, bandwidth is also a serious handicap because the student will not be able to download large video files through telephone lines. Unlike first world countries, bandwidth can also be a problem because the key route connectors are insufficiently narrow. In addition in some countries, customers are charged for Internet access by the size of the download files. This practice greatly discourages the use of multi-media over the Internet. Only infrastructure investment, time, and policy change will overcome those barriers. Obviously, the availability of computers also varies from country to country. However, governments can make their computers available to their workforce during non-working hours for educational purposes and this might greatly help public employees to get an MPA education in many places in the world.

Another implication of web-based education is the possibility of sharing top talent in teaching public administration. For example, a well recognized expert can prepare a given course and students in all parts of the state or world can take that course. One of the realities of web-based instruction using the asynchronous discussion board is that it takes time to monitor correctly. Thus, an ideal class or section size is about 24 students.

Nevertheless, classes can be huge if universities use well developed course materials and course “tutors” to monitor the discussion boards and grade the essay material. Class preparation is much more difficult but a teacher on video can teach to thousands if his or her school or university uses course tutors for daily and weekly communication with the students under the direction of a senior teacher (Baker, 2002).

The use of the term online tutor or e-tutor is becoming more common place, especially in Great Britain. These online course tutors rarely have face to face contact with students but are still responsible for providing academic support to groups of students while they are studying a particular course. Philip Barker (2002) and Shirley Bennett and Debra Marsh (2002) explain the development of this new role in higher education and some of the challenges associated with this new position.

The productivity implications in higher education are remarkable because course tutors would not be paid at the same pay rates as tenured or senior professors. This would require a whole new approach to teaching especially in universities but the result would be lower costs for higher education while improving the teaching quality. Not only would labor costs be lower but building costs for classrooms would also be lower. At a time when higher education has become a major cost to government, web-based education spells cost relief.

However, the real advantage comes from team teaching across universities and schools. In many countries, the needed talented professors are not hired because of cost or insufficient labor pool. The web-based approach means that one or more professors can build and even tailor a course for several sets of students in various countries. Peers can evaluate the online course, including the lectures, and can suggest improvements that

better fit the targeted students. The teaching product would improve as the feedback for improvements is more easily accomplished (Merlot, 2002). This approach permits cross national talent teams to create courses for students at a much lower per student cost. Thus, the talent of the world can be brought to each place in the world at an affordable cost for the students and governments that help fund the education programs.

BUT IS WEB-BASED EDUCATION ANY GOOD?

The nay-sayers of this innovation are many but this article only addresses concerns related to teaching public administration at the graduate level. Certainly, professors, especially those under consideration for tenure, will not want video records of their teaching that a tenure committee can use against them. Certainly, college administrators will not want to radically change the way they organize the teaching effort. Resistance to innovation is normal and overcoming that resistant will be difficult, as is true with most major innovations. This section of the article will review some of the more common criticisms of web-based education.

Criticism One. The academy has not conducted a thorough research on the efficacy of learning online (Speck, 2000; Green, 1999; Merisot and Phipps, 1999). With this argument, we would not implement any innovation. This argument tells us not to implement this innovation until the academy and policy makers are confident that this new innovation will live up to its promises (Speck, 2000: 74). This is a cry normally heard when a major innovation starts to happen. The answer is also normal. Certainly, due caution is necessary but this should not be a reason for stopping innovation. Try it

and see what happens on a more limited basis. If it works, expand its use. If it does not work, then stop the implementation.

Criticism Two. The academy has not prepared professors to teach online classes (Speck, 2000: 75). In any innovation, the first stage sees innovators that are willing to experiment without proper assistance or guidance. Ideally, professors should be compensated for their time and effort the first time they prepare such classes. Ideally, a full technical support staff should exist to assist the professors and even teach the professors what to do. Hopefully, such support will occur at the better universities but many will just do the best that they can. As more and more professors have experience with web-based education, they can share their knowledge and provide then needed teaching expertise in seminars and training sessions.

Criticism Three. With web-based education, the academy has adopted an entrepreneurial desire for economic gain rather than the desire to support through acquisition of knowledge through rigorous education (Speck, 2000: 78). Clearly, many institutions of higher learning will see web-based education as a means to increase revenue and that will motivate their decision rather than providing rigorous education. However, this does mean that web-based education is not a means to provide quality rigorous education. Although different, web-based education *can* be as rigorous as traditional teaching. For many public universities suffering from budget constraints or a mandate to teach a wide geographic area, web-based education may be the only viable alternative that provides a quality professional education.

The cure for abuse (accreditation and the market place) is the same cure that exists in traditional education. For example in the United States, the National

Association of Schools of Public Administration and Affairs can and should establish accreditation guidelines for online courses and web-based MPA programs. The other classic cure is the market place where students and employers seek out places that offer quality education regardless if is traditional or web-based. Those universities that do not offer a good product will not attract students and employers will not wish to employ students from those programs.

Criticism Four. Web-based education is biased against liberal learning that requires a give and take communication between and among students and the teacher (Carsten and Worsfold, 2000: 83). Those who argue for liberal learning say it is “one of the primary means through which individuals develop their own personhood, and such development has as its foundational value and goal the freedom whereby students make choices that contribute to their personal well-being” (Carsten and Worsfold, 2000: 83). Is web-based education impossible for the teacher who wishes to pursue liberal learning? The answer is a simple NO. This approach to education is just as possible with web-based education as it is in traditional education. Certainly, the means for teaching liberal learning vary from traditional education, but they exist. Several large research consortia exist that are developing the programs and algorithms that will improve the technology to perform all the interactive activities to support a liberal education (ADL, MIS Global; Merlot).

Criticism Five. The online approach eliminates the value of personal relationships in the name of efficiency and students can no longer question the authority of the teacher because they cannot argue a position until its weaknesses are exposed in classroom dialogue (Carsten and Worsfold, 2000: 84). The web-based education discussion board,

chat room, and email list serve provide the means for a teacher to develop these characteristics in students. Certainly, the teacher can choose not to use these tools but the traditional classroom teacher can also halt any classroom discussion. Again, the accomplishment of this teaching objective is purely a function of the teacher and not the vehicle used by the teacher.

Socialization of students into a professional culture has always been and must remain a great concern of a quality MPA programs. Technology can help to accomplish that socialization by using a combination of personnel web pages, email, posted student photographs, and posted videos.

However, an online MPA program can also require students to visit the main campus two or three times during the 18 to 24 month program. For example, upon entry into the program, the MPA program can require students to take a computer lab on how to use the computer but also provide socialization activities to make sure that students meet each other and understand the meaning of a professional education. Possibly, in the summers, MPA programs can require students to visit campus to engage in thoughtful retreats, prepare for internships and directed reading assignments, and meet role models of professionalism. Possibly, the programs could require the students to attend a professional conference such as the American Society for Public Administration's national conference as a class and spend time at the conference as a group participating and reflecting on what they were learning from the experience.

Criticism Six. The online approach merely eliminates a student's literacy because of the over reliance on visual culture (videos, audios, automated quizzes, and so on). This over reliance short circuits the brain development necessary for literacy as well a

critical abstract thinking (Healy, 1990 as cited by Carsten and Worsfold, 2000: 85).

Web-based education does encourage the teacher to use videos, PowerPoint, and automated quizzes. But the teacher can and should still require the student to read the assignment text material. The teacher can still require critical abstract thinking from the student in drop box assignments and discussion board forums. Again, the criticism is directed against the teaching of some rather than the medium used for teaching.

Criticism Seven. Sometimes teaching simply requires a face to face discussion between the teacher and the professor in order to make the necessary point with the student. Yes, it does. But again, web-based education really does not prevent this face to face exchange unless it is organized incorrectly. With online and traditional education, a university can (and some universities) do teach classes of over 1,000 students. The occasionally needed face to face interaction just does not exist. However, if the approach to web-based teaching includes dividing a class into small sections of 24 students and using course tutors to manage the sections, then tutors can provide the occasional face to face interactions in person or by using technology such as net meeting. If a rare substantive question occurs beyond the ability of the course tutor, the option always exists to ask the web course preparer.

In summary, teachers can abuse both web-based education and traditional education but both can also provide the necessary quality rigorous education. The reasons for poor teaching remain the same in both approaches: poor instructors and poor educational policies at the university level. Blaming the approach is misdirected. Who among the people reading this article has not had at least one terrible classroom experience as a student under the traditional approach to education? However, fewer

such experiences should occur in the web-based environment because there is a record maintained of the actual teaching and peer review of course materials is more easily accomplished. Thus, school administrators can more easily isolate poorer teaching because they can actually witness the teaching and peers can more easily point to where and how the instructor can improve his or her teaching.

In any innovation that requires fundamental change, criticisms from those that need to change and do not wish to will be common, as they are searching for reasons not to change. At its logical extreme, web-based education does require radical change and the cries of resistance will be loud. In fact, the very nature of the human condition seems to include resistance to most changes. For example, some still argue against the automobile over driving a horse and carriage. But resistance to innovation does not mean that change should not occur. With resistance to innovation, we need better management, planning, and flexible leadership to not only overcome the resistance but to use the constructive criticism in the resistance to improve the innovation.

BARRIERS TO WEB-BASED EDUCATION

In public administration education, the resistance of faculty and the reluctance of higher educational administrators to adapt to this new approach will retard the advancement of web-based education. As noted before, new professors resist this approach because they do not have a secure position. They realize that the full use of this approach to teaching requires them to record their lectures and the development of this type of course requires a great deal more effort and organization on their part.

In traditional courses, non-tenured professors know that tenure committees often make judgments on their teaching performance based almost entirely upon student evaluations. Actual evaluations of their course content teaching materials are rare. Therefore, they focus on preparing entertaining and often relatively less challenging course materials that appeal to students. In web-based courses, non-tenured professors know that tenure committees will make judgments on their teaching performance using the course materials they develop and post online for the world to see. For example, any misstatements and errors are officially “on the record” for the tenure committee to see during the tenure process. Therefore, there is less chance that they will get a positive review under the web-based approach. Being normal intelligent people, they will naturally avoid web-based teaching.

Also, web-based education requires a great deal more effort. Tenure committees judge non-tenured faculty on education, service, and research. The latter normally means publications in peer review journals. If in five or six years, a non-tenured professor does not publish enough, then he or she is out of job. At better universities, the teaching load per semester is lower but the publishing expectation is higher. The reality of web-based teaching is that it requires at least double the amount of time per class if the teacher both prepares and manages the class. The communication (email and discussion board primarily) between the teacher and the professor is much greater in a web-based class than in the traditional class.

In addition, preparation is more complex. In traditional teaching, the professor only needs a syllabus, an extensive set of notes, some tests, and some plan to present the material to the students. In web-based teaching, the professor needs the same as the

traditional class; but he or she also needs a complete set of PowerPoint slides that cover the lecture notes, videos of him or her lecturing each PowerPoint presentation, a very large set of objective quizzes with feedback comments on right and wrong answers, and a set of forums for the discussion board. Because the course preparation time is often double that of the traditional class, there is less time available to publish in spite of the fact that publishing expectations are not lowered. Thus, web-based education increases the new professor's risk of perishing in their "publish or perish" world.

Tenured professors are also not encouraged to support this method of teaching because of the greater work required, the new required skills and the increased accountability for what is taught. It requires them to learn a whole new set of teaching skills. For example, the professor should learn and use Microsoft Producer. This means the professor needs to master the use of PowerPoint, video presentation, video production, and integration of PowerPoint with the produced videos. Without some form of compensation, either financial or in release time, few tenured faculty are likely to take on the extra work. Once a course is placed on the web, the department chair might wish to see and comment on the professor's work, which before was probably never reviewed unless student complaints warranted it.

Administrators will find web-based education a challenge because the need for technical support and equipment is critical and the whole structure of the academic department will change. In traditional education, the academic department need only ask the library to order books, the facilities people to find classrooms, and secretaries to help faculty type papers and so on. In web-based education, the academic department needs to do all the same things but it must also hire course tutors as adjuncts or instructors to work

with senior professors. The senior professors prepare the major online courses and ask the computer support staff to always keep the online course available for students and provide the necessary digital camera equipment and adequate computer capacity. This means that academic department budgets will shift to increasingly pay for less expensive adjuncts and instructors, who will be less qualified and also less committed to the institution and the program than tenure track faculty. This also means department chairs must manage the tension between the more prestigious tenure track faculty and more numerous instructors.

Many new web-based professors may not like that their job now requires administration. In traditional education, the professor might supervise a graduate assistant but essentially the professor did the teaching. In web-based education, the professor must also work with the computer support staff and course tutors. The introduction of new computer technology, the need to keep the course up on the web, and the desire to upgrade the quality of the course materials require the professor to have a strong relationship with the computer support staff. The professor's primary responsibility will shift to preparing and updating the online class materials and the actual daily relationship with the students will fall to the course tutors. The course tutors must also interact with the professor in order to improve the class and clarify any points of confusion over course substance. The relationship with course tutors maybe within the academic department but it can also be a virtual relationship when the course tutor works at other universities that merely contracts with professor to provide the course material.

One simple method to overcome the above barriers is merely to pay the professors extra money to move to online teaching. Given that web-based education actually should

increase revenue, the university can use some of the extra money for that purpose.

Typically, a university might be willing to pay the professor more money for the extra work of preparation but additional continuing compensation is not likely. However, web-based professors may soon argue that students at other universities and sites take their classes and they should receive higher compensation. Such web-based professors will be in demand and should command larger compensations.

CONCLUSIONS

Web-based education is a reality but it is also a changing reality. In many universities, online education in public administration is not much more than placing a correspondence course on the web. Correspondence courses are useful but they also have well known limitations. Many online courses share those same limitations. In the rush to technology, many universities felt that placing text on a web page was the answer and they saw a cheaper way to provide higher education to more students.

This article is not about that type of education. Technology provides a remarkable new plateau to launch education for the creative university and professor. Web-based education is more student centered rather than professor centered education of traditional education (Knowlton, 2000). Within instructor decided limits, the student now picks the place and time to learn. The student can look at the lecture not once but see it as many times as the student wishes. In addition, the student can push the pause button and freeze the lecture to check a reference, answer a phone, or do what ever is immediately needed. Web-based education permits the professor to introduce the student to a much richer variety of text, external links, audios, and videos to the virtual classroom. The student

becomes a seeker of knowledge rather than a repository (Freire, 1970). Timely feedback is important in education and web-based education provides instant feedback. A full use of the discussion board permits much better student dialogue than traditional education and a record exists on the exact content of that dialogue. Creative professors can educationally link videos, PowerPoint slides, discussion groups, and quizzes. Creative professors can use these means to teach analytical techniques or better human relations (Knowlton, 2000).

Notwithstanding the real educational advantages, the driving force for this policy shift will be economics. The costs of higher education are high and the pressures on government budgets are significant. Given those pressures, getting more education for the tax dollar will become increasingly important. For example, in most states in America, many local and some state government administrators find getting an MPA degree practically impossible with traditional education but will find it very possible with web-based education. With web-based education, a consortium of state universities can prepare MPA courses and have them taught by local course tutors at a fraction of the cost of the traditional approach. Such budget arguments are real and will eventually encourage universities to experiment and then adopt this approach to education.

At one time even the oldest technologies were new. The more significant ones changed the human condition. For example, using written symbols to represent information was an innovation at one time. It had a remarkable unanticipated and significant impact on the way people thought and spoke, as it created literacy in society (Ong, 1982). Another example is the discovery that extracting metal from rock made firmer substances that not only changed construction practices but also the art of war

(Leamson, 2001). Neil Postman (1992) said, “[t]echnological change is not additive; it is ecological. A new technology does not merely add something; it changes everything.” The web is a new technology that is now starting to change the education process itself in the form of web-based education.

Resistance to this innovation will also occur, but resistance occurs with each new innovation to some extent or another. Some people still refuse to use a telephone or go to a doctor for modern medicine. Many professors and universities will resist web-based education but web-based education will grow. In the process of growth, no doubt many professors and universities will poorly use the technology available to teach online just like many people drive an automobile poorly or use other technologies unwisely. Their problem is not the innovation but their capability, which they refuse to improve. This innovation will grow and it has the strong potential to significantly enhance the delivery of public administration education to humankind.

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