

**Taking Principles Online:  
Successful Strategies for Internet Delivery**

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# **Taking Principles of Microeconomics Online: Successful Strategies for Internet Delivery**

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## **ABSTRACT:**

This paper describes some key issues, pedagogical and technological, in transforming a classroom-based course into an Internet-based course. In a summer course offered in 2000, the instructor successfully condensed a semester course in Principles of Microeconomics into a 4-week course. The students were exposed to a variety of technologies including streaming video lectures transmitted over the Internet, Internet-based course material (syllabus, grade reports, homework assignments, sample problems and solutions), and examinations taken over the Internet.

This study describes these technologies and discusses how they were implemented and used to recreate elements of the economics classroom environment, assesses both the benefits that they can provide as well as issues that limited their effectiveness in learning, and compares outcomes to a summer course where the students had the material presented directly to them by the same instructor, instead of via Internet-based technologies.

The paper also examines the role of the instructor in facilitating learning in an online environment, when the direct interaction between instructor and student has been replaced by indirect contact. The instructor still plays an essential role in guiding the learning of the student and, once comfortable with technology, can increase the level of participation of students in a class equal to, or even greater than, that in a lecture environment. The paper concludes by summarizing the strengths and weaknesses inherent in teaching an online course and suggests methods to improve learning outcomes and retention of students.

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<sup>1</sup> Dakota State University is a state university whose mission is to integrate technology into all aspects of its curriculum. It has been nationally ranked in the top 10 of the 100 "Most Wired" colleges and universities of similar size in the U.S. by Yahoo Internet Life magazine for 1999 and 2000.

## I. Introduction

This paper discusses the issues involved in teaching a course in principles of microeconomics over the Internet. Internet delivery of courses is an area that continues to gain interest. While distance education has existed for centuries, the Internet has opened up a new avenue to reach students across the world and connect them simultaneously to a common discourse on an academic subject. This paper explores one approach to designing and implementing an online course and examines the effect on student learning.

In the summer of 2000, Dakota State University delivered its first economics course to be taught completely over the Internet. The course had the ambitious goal of covering all of the material typically discussed in a traditional one-semester course in only four weeks. The primary insight into the achievement of this task was to recognize the fundamental characteristic of the Internet that makes it particularly well suited as a tool for education, specifically its efficiency in presenting of a large volume of information in a variety of formats. This feature allows students to accelerate their learning, while maintaining their interest and allowing them to control of the flow of information. When interaction with the instructor and other students is also available, this delivery mechanism can enable the student to develop an understanding of the material equivalent to that received in a traditional classroom. A cursory analysis of the student's results indicates that their performance was no worse in almost every respect to a principles course taught the previous summer.

The paper also addresses the issues facing the instructor who is preparing to teach an online introductory course in economics. There are three primary areas that need to be addressed: Faculty development issues, course development and design, and student readiness. The issue of faculty development addresses the question, "Does the instructor have the necessary instruction, tools and support to teach an online course?" An online course has different requirements than a traditional classroom that the faculty member must have the resources to address. The second issue is course design, and addresses the question, "How will the course be structured so as to benefit, complement, or (at least) minimize the hindrance to the student's learning activities?" The last issue to address is student preparation. The question of "What information or skills do online students need

to have to successfully complete the online course?” is important, and typically underemphasized. Too often this question is addressed only once the course is about to start or while already underway as student questions and difficulties arise. This fact may suggest a reason why withdrawal rates in online courses are significantly higher in online courses (For example, Vachris (1999) notes that compared to classroom courses withdrawal rates for online courses at her institution are twice as high.).

These issues are addressed in the literature review in Section II. The paper then discusses the techniques and practices used in the course taught last summer in Section III. The paper examines the role of the instructor as a facilitator of learning and evaluates the learning outcomes and attitudes of the students who took the course in Section IV. Section V concludes with some summary comments evaluating the strength and weaknesses of teaching an online course and makes some suggestions to improve learning outcomes and retention of students.

## **II. Literature Review**

The economics education literature could be characterized as reaching a general consensus that the use of the Internet in teaching economics can yield potential benefits to student learning and attitude. A number of studies have been undertaken that demonstrate benefits of incorporating web-enhancements to a course. (See Sosin (1997), Katz and Becker (1999), Talley (2000), and Coates and Humphreys (2001) for discussions of the use of the Internet in traditional classroom-based courses.) Moreover, Coates and Humphreys (2001), in a recent survey, find that economics department are offering more and more ‘cyber-economics’ courses<sup>1</sup>, especially introductory courses, than had been previously determined in the surveys of online courses conducted by Sosin (1997), Blecha (2000) and Navarro (2000).

The finding that online courses are proliferating is significant. Coates and Humphreys identified 120 colleges and universities in the United States and 164 individual economics courses that were offered over the WWW in the Fall 2000 semester. They also find that the majority (53%) were offered by academic departments,

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<sup>1</sup> Coates and Humphreys define cyber-economics courses more narrowly than other researchers. They exclude discussion courses that have any face-to-face contact as well as those courses where CD-ROM-based lectures are the predominant source of instruction (although such materials may supplement a cyber-economics course).

as opposed to Continuing Education or other non-academic departments that presumably target non-traditional students. This implies that online education is being tried at more and more departments as an approach to economics education for traditional students, suggesting that, as the authors put it, “cyber economics courses offered by academic units are substitutes for classroom-based courses.” (Coates and Humphreys, pg. 11). Not surprisingly, they also find that the overwhelming majority of the courses were introductory courses, and suggest that the bias in offerings toward principles-level courses seems to be increasing over time. It is therefore appropriate for this paper to examine some of the issues involved in the design, execution, and evaluation of an online principles course.

Before examining the specifics of the online course I delivered, it is necessary to provide a conceptual framework in which to consider the construction of an online course. As a resource to prospective online instructors then, the following discussion advises the instructor to address three primary areas in preparing to teach an online course: faculty development, course design, and student preparation.

One of the greatest weaknesses of an online course may not lie in the course design (the look of the website, the content of the web pages), but in the proper preparation by the instructor to teach the course. It is important to accurately assess the needs of the course and the responsibilities required of the instructor for the course to function smoothly and effectively. First and foremost, instructors need to develop as much experience as possible with the technologies they will use in an online course. Instructors not only need training in the use of the technologies, but must also understand the pedagogical advantages and disadvantages inherent to each.

For example, Leuthold’s (1999) paper on the design of a course homepage is an excellent introduction to the prospective first-time developer of a course website. However, an instructor may not realize that it is not effective to change the online syllabus in the middle of the class, say to change the date of a quiz or exam. Since most students will look at the syllabus of the start of the class (if at all), this would be a poor approach to announcing an important change. (It is much better to send an e-mail alerting the class or better yet post an announcement that they can easily check.)

Understanding how students interact with and use the Internet resources for the class is a key to avoiding misunderstandings.

Therefore, to gain experience with Internet technologies, try various elements of the online course in a traditional classroom first. In other words, it is recommended that instructors first teach a web-enhanced course before attempting an Internet-only course. (A web-enhanced course is a traditional course that makes use of Internet technologies to assist in learning. An emerging delineation is that all courses can be classified as traditional classroom, web-enhanced classroom, or Internet-only courses.) The web-enhanced environment has several advantages, with the primary one being guaranteed access to the students and immediate feedback. Problems may go unreported for a significant period of time in an online course while they work on restoring it or find a less than satisfactory way to work around it. In a web-enhanced classroom, the instructor is guaranteed an opportunity to ask the class if there are any questions or problems that have occurred.

The instructor will gain experience in determining the solution to common problems and will soon identify which technologies make up the 'critical path' of instruction for the course. Critical path technologies are the set of electronic resources and features that, if they should fail, prevent the students from completing the requirements of the course. Identifying critical path technologies and developing 'back-up plans' in case of their failure can make the difference between a satisfying experience and one of pent-up frustration for both the instructor and the students. (Parks (1999) applies this concept in the context of PowerPoint presentations when he states he is always prepared to do a 'chalk-and-talk' presentation in each class in case the projection technology fails.) Knowledge of the critical path technologies, which typically include Internet access for the students and instructor, e-mail access for the students and instructor, and elements of the web site that cannot fail when used, like online testing hardware and software, will prepare the instructor to handle the errors, miscommunications, and system failures that could (and likely a few will) occur. This is therefore part of the required knowledge that an Internet course instructor must have before the course begins.

Another aspect of the faculty development process for online instruction is to recognize that the role of the instructor in a course may change significantly, depending on the design of the course. Kirk (2000) surveyed 144 online instructors in a variety of disciplines to assess their view of the functions or roles that instructors employ in an online course as compared to the traditional classroom setting. The study identified nine traditional roles (Authoritarian, Counselor, Discussion Monitor, Evaluator, Subject Matter Expert, Information Presenter, Instructional Designer, Mentor, and Role Model) and asked respondents to answer questions that assessed whether teaching an online course necessitated changes in these roles. The survey allowed respondents to indicate whether their roles were more, less, or just as equally time consuming, important, challenging, and satisfying in online courses compared to traditional courses. The roles of Instructional Designer, Evaluator, and Role Model had the greatest number of significant differences in these five areas. For example, the majority of respondents found the roles of Instructional Designer (84.5%), Discussion Monitor (66%), and Evaluator (55%) more time consuming in online teaching. This study also shed light on some of the new demands that may be made by the online student.

Moreover, the study indicated that the instructor will sometimes be asked to serve as a 'computer technology consultant,' that is the students will often turn to the instructor for technology advice and assistance. Clearly, as instructors of economics we are not trained to diagnose network router failures and reconfigure operating systems, nor would we want to learn to do so just to prepare for an online course. But it is important for faculty to be aware of the potential difficulties and be able to advise students on who to call or where to turn next for help.

Indeed, many studies have commented on the increased role of the faculty member as a facilitator in the self-directed study of online students. Distance education, defined as learning that takes place without the physical presence of the instructor with the learner, shifts the focus of the instructor from being the "sage on the stage" to the "guide on the side" (Young 1997). The roles of mentor and counselor take on new importance in this context, since students frequently feel isolated from the instructor and other students. Counseling activities, like positive reinforcement e-mail and sending a brief message to check on their progress or answer questions motivates them to

participate and promotes their confidence. Mentoring by directly responding to their questions and inviting them to apply the concepts to their own lives also reduces students' fear and reduces the sense of the instructor as an authoritarian, allowing the learner to take control and responsibility for their learning outcomes. (Kirk, 2000.)

The relatively greater importance and challenge of the role of instructional designer leads naturally to the next area of interest: course design. The literature contains numerous examples of activities and elements of Internet course design. Many sources already cited in this paper address these issues.<sup>2</sup> Indeed, as noted in Agarwal, Coates, Day, Humphreys, Kane, and Vachris (2000) and elsewhere, the *Journal of Economic Education's* online section is an excellent resource for prospective online course instructors. Instead, this paper examines more broadly the types of learning activities that can be employed. Fundamentally a given element of an Internet course can be thought of having one of two goals. It can attempt to replicate or reproduce some element present in the traditional classroom, such as the use of streaming video to broadcast lectures and the use of web sites to publish grades and distribute the syllabus. Or an element of the course can attempt to enhance student learning by interactively engaging the student, increasing student-student or student-instructor communication or add an activity that is not typically available or performed in the traditional classroom.

Coates and Humphreys (2001) consider these elements to be opposite ends of a spectrum with "the web-based equivalent of the typical face-to-face lecture course at one extreme and a cybereconomics course focusing on active learning techniques and student interaction with course material at the other extreme." (pg. 11) While this is a useful way for considering the level of interactivity between the student and the tool, it may not capture the innovative and interactive uses to which these tools classified as 'classroom emulation' may be put. For example, the authors classify streaming video as a passive technology, since the students merely watch the instructor lecture via the Internet, not unlike a classroom lecture. However, in my course the students also have incomplete lecture notes that must be completed by writing the key information (definitions, charts and graphs, key points) thereby reinforcing the concepts through their written expression.

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<sup>2</sup> Simkins (1999), Fair (1999), Daniel (1999), Manning (1996), Agarwal and Day (1998) and (2000), Parks (1999), and Talley (2000) illustrate the wide range of use of Internet technology in the classroom.



Therefore so-called ‘passive’ tools can be designed to yield more interactive uses in the online course. However, their point that video lacks the two-way flow of information that can make a lecture more dynamic is well taken.

Therefore, it is recommended that the online course designer look to incorporate active learning methodologies into their course. Numerous studies have also advanced the proposition that the ‘active learning’ methodologies must be used by the students and therefore the instructor should also change their teaching techniques to accommodate this new role. For example, Chizmar and Walbert (1999) argue that an important implication of Internet use for pedagogy is that the Web can assist students to discover important concepts on their own. Moreover, they encourage the use of “The One-Minute Paper” and other writing exercises to promote learning and retention.

Internet-based writing assignments and research force students to apply their critical thinking skills. Students can be asked to identify and assess different (and perhaps sometimes conflicting) sources of information and apply the relevant aspects to the assignment at hand. This involves the students directly in the evaluation of source material and could significantly enhance their understanding of concepts and give them experience in developing important 'life-long learning' skills. Talley (2000) provides an example of the use of Internet research paper in the principles course, thereby also promoting ‘writing across the curriculum’ in the introductory microeconomics course.<sup>3</sup> Writing of this sort can challenge the student to develop a higher cognitive level of understanding of the course material. To a lesser extent, the inclusion of a bulletin board and chat room could also allow students to formulate their thoughts and questions more formally and may even provoke a long running dialog between the student and others in the course. Since other studies discuss elements of online course design in more detail than will be covered here, the last element of online course preparation concerns student readiness for online education.

Several recent studies have begun to discuss the role of student preparation and requirements for online courses. Outside of economics, other fields have begun to

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<sup>3</sup> Harter, Becker, and Watts (2000) report “Term paper assignments were limited, with greatest use in upper-division field courses (23 percent mean), followed by statistics and econometrics courses (12 percent mean).” Therefore, research papers are assumed to be used in less than 12 percent of traditional classroom introductory economics courses.

conduct research into student's ability to use the technology that is thrust upon them in an online course. In a notable study, Hara and Kling (2000) examine sources of student distress in an online course. In it, they discuss such sources of distress as the perception of isolation and recurrent expressions of frustration, anxiety and confusion. It is clear from the six graduate students in the one course they study in detail, that these students did not receive sufficient preparation, either from prior prerequisites or from the instructor for the experience of an online education.

Reinforcing this notion that online education may not be everyone, Leuthold (1999) classifies students as sequential or random and concrete or abstract learners (based on the Gregorc Learning Style Delineator, a cognitive model of learning) and determines the correlation between students learning styles and their use and satisfaction with computer-based instruction by her freshman economics students. She finds that students classified as 'concrete' made fuller use of the computer-based materials and enjoyed the course more than 'abstract' learners in her small sample. This conclusion is also reached for traditional courses in economic principles.<sup>4</sup> Further, in a recent study, Agarwal, et al. (2001) find empirical support that freshman and sophomore students tend to fare worse in online courses, suggesting to them "that teaching principles-level economics courses over the WWW is a bad idea. The freshmen and sophomores enrolled in these sections would be expected to correctly answer between six and eight fewer questions correctly on the TUCE than juniors or seniors in face-to-face sections." (pg. 26)

Taken in combination, it would appear that there is a growing body of evidence that suggests a wide range of teaching techniques and technologies should be employed in online instruction. Certain groups of students, based on a variety of exogenous factors including maturity, personality, and gender (as suggested in the studies above), will tend to under-perform if methods of presentation, reinforcement through assignments, and assessment instruments that are less favorable to their style of learning are used in online courses. These results reinforce the importance of clear prerequisites for the level of

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<sup>4</sup> Ziebert (2000) uses the Myers-Briggs Type Indicator to classify over 600 students in 27 sections of introductory economics courses to examine their correlation between personalities and learning outcomes, as measured by their performance on (pre- and post-) TUCE III exams. She finds that different students fared differently on the TUCE, controlling for differences in instructors and academic ability, as measured by SAT, ACT, and GPA. Some personality types fared better while others fared worse.

technological sophistication required in the course and for instructional design of online courses to recognize and accommodate a wide range of learning styles and abilities.<sup>5</sup>

### **III. An Online Principles Course in Microeconomics**

It is my hope that this paper will be of service to future instructors of online principles courses, for in no sense did I follow all of the advice above when preparing the course taught in the summer of 2000. Although I had considerable familiarity with web-enhanced teaching (Talley (2000) reports my experience in teaching with technology), I chose to design the course to first-and-foremost approximate a classroom environment as closely as I could. For the reasons stated above, this is not necessarily the best approach. The web site can be found at: <http://www.courses.dsu.edu/econ201/summer00/>. (I will leave it as a demo until at least Jan 1, 2002.)

The course was scheduled for four weeks from June 12 – July 7, 2000. The students were allowed to register through the Office of Distance Education, were told the length of the course, that it was delivered by Internet and given the name and ISBN of the textbook so they could purchase it ahead of time. The course website was redone using frames. The only page initially accessible before the official start of the course was a welcome page that contained a) the syllabus, b) an ‘introduction survey’ for them to complete prior to the first day of class, c) instructions for downloading the only additional piece of software needed for the course, RealPlayer, d) an icon for the students to download and install RealPlayer on their home computers (the university computer labs were pre-configured with RealPlayer), e) a ‘welcome video’ that would allow them to successfully test RealPlayer, and f) small pictures (GIF files) of the required textbook (Bradley R. Schiller’s *The Microeconomy Today*) and the optional study guide, to make sure they purchased the newest version.

In designing the course, I envisioned that the students would view videos of my traditional classroom lectures over the web, approximately 8 hours of video per week, while using the chat room and bulletin board to interact with each other and myself from

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<sup>5</sup> In response to the Agarwal, et al. (2001) study it should be noted that although a wide range of methodologies were used in the online courses under examination, no course included all of the methodologies, and most emphasized only a few active learning methodologies for credit, like online quizzes, group assignments or projects, participation through online communities (like a bulletin board or chat room), and written assignments. Therefore, the conclusion that teaching introductory courses online should be avoided may be somewhat overstated

Monday-Thursday of each of the four weeks. On each Friday of the first three weeks, each student would take an online 'quiz' that would count for 15% of his or her grade. The Friday of the last week each would take a written proctored final exam that would count for 35% of their grade. 10% of their grade would consist of written participation in discussion of the bulletin board topics. The remaining 10% would consist of 4 'internet assignments' that would require the students to visit websites and collect data or review material and write an analysis. Needless to say, this was an ambitious agenda for four weeks.

Once the class officially started on Monday, June 12, I activated the links to the rest of the course. I would add material to the lecture videos and homework assignments web pages one week at a time to make sure everyone was progressing through the course material at approximately the same time, even though the course was designed to be asynchronous. In addition to the 'welcome' page, there was a 'home' page (basically displayed contact information for me and my undergraduate 'online assistant' who served as technical support), the 'lecture videos' page (which also contained chapter-by-chapter lecture notes to complete while watching the videos, practice homework assignments with separate answer keys, and sample quizzes and answer keys), the 'course grades' page (password-protected for individual display of exam, internet assignment, and discussion participation results, updated weekly), the link to access the 'WebBoard' discussion board/chat room, a 'quizzes' link that was only active on each Friday to access the timed online quiz, a 'proctor's information' page with instructions for finding an acceptable proctor for the final exam and the Internet 'assignments' link that was active the first day of class. The Internet assignments could be sent one-by-one or as a group and were due by the last day of class, July 7. Electronic submission was permitted.

All class announcements were made via the WebBoard. Anyone interested may visit the WebBoard for this summer class by clicking on the WebBoard link and selecting the 'Guest' button at the login screen. You will see a list of conferences on the left (Announcements, Week 1 Discussion Questions, etc.). Clicking on the conference name or the + symbol will expand the conference so that you can see the discussion threads. Click on a thread to read it from that message on. I was the only one allowed to post messages to the Announcements conference. Anyone who was a member of the class

could post to any of the other conferences. The conferences are organized so that the students could respond to 2-3 discussion questions each week of the course. If you visit, you will find that the Week 1 Discussion Questions conference is somewhat confused, since students initially didn't always 'reply' to my posts, but instead 'posted' there responses, creating brand new threads. By the third week, the conferences are much better organized. The students received minimal instructions on using the WebBoard and were encouraged to send e-mail.

After a couple of days, I had a student request that I activate the 'chat' feature so they could also use chat rooms. I did not monitor the chat activities—participation points were awarded if the student posted an intelligible comment to the each weekly discussion question conference. The Frequently Asked Questions conferences were for my use to answer multiple questions on the same subject. As is evident, there was one question I received by e-mail in the first week. After the class took the first quiz, with the result that some students did not perform so well, I cajoled them into making better use of the FAQ conferences in the remaining weeks, although the final week saw no FAQ questions (probably because of the low relative weight of the last week's coverage on the final).

The course did evolve from my original specifications over the four weeks. I discovered that some students did poorly on the first quiz, so I constructed an extra credit assignment that allowed them to improve their Quiz 1 score by up to 10%. An error on my part in the total number of points for the Internet assignments left some students believing that they could complete the first three of the four assignments for full credit. I used this as an opportunity for extra credit as well, allowing their result on the Microsoft Antitrust Trial essay to replace a Quiz Score. Since in a full semester course, the essay itself accounts for 7.5% of the grade, I felt this was a fair compromise. The fact that the error was not discovered until the fourth and final week left little time to impose another remedy. In addition, the students had made plain their stress in completing the course so this was another way to adjust the burden and make equally clear that studying for the final exam should be their highest priority in the last week.

#### **IV. The Instructor As Facilitator & Course Outcomes**

There are several aspects of an online course that require the instructor to serve as a facilitator. Serving as moderator for discussions on the bulletin board, answering e-

mailed questions during office hours (10 – noon CST MTWHF, which were routinely ignored), and addressing specific technological difficulties on a case-by-case basis often required different skills than are needed for a traditional classroom.

Besides offering the first online course in economics by Dakota State, this was also the first time I used a bulletin board in a course. I must admit I had some misgivings in assigning credit for participation. (It is expected and does not count for credit in my traditional classes.) However, I was very pleasantly surprised and impressed with the end results. Feel free to browse the comments made by the students and myself—these comments have not been altered, so I apologize in advance for the spelling errors and poor grammar, of which even I am guilty.

Although some students spouted baseless opinions and even on a rare occasion made almost completely unintelligible statements, several routinely put forth well-reasoned arguments, complete with URL references to sources to back their claims. As a discussion moderator, this was new to me so I tried to stay out of the way of the students discussions, tending only to correct blatant misstatements of fact or answer questions directed to me. I kept the number of topics small, so that hopefully more detail and depth in the discussions would emerge over time. Unfortunately, the tendency for students to agree with consensus opinion, rather than forming individualized economic arguments, did tend to appear, but there were notable exceptions in the posts of some of the better students.

Overall, the interaction on the bulletin board exceeded my initial expectations for the usefulness of this aspect of the course. Several students commented that this was one of the best aspects of the course, since it tested their understanding of the concepts by applying them to real life situations.

I must note that I have not always had such success. I used a bulletin board in my traditional classroom of 50 principles students last semester. It was not required, as I didn't assign any weight in my grading scheme to participation, and therefore the students ignored it. Even though I thought I had written some stimulating questions and a few students did respond, their posts went unacknowledged for days and in the end I deactivated the WebBoard due to lack of interest. I believe this should serve as a

warning that participation credit may be necessary to gain the critical mass of participants that makes a discussion board useful.

Teaching an online course means having 24-hour, 7-days-per-week office hours. This was especially true in a course with such a short horizon. It left very little time to deal with problems. For example, the very first day of class the server containing the lecture videos (a critical path technology) went down. As you can read in the Announcements conference, I announced the error “Chapter 1 Lectures Offline” but gave no explanation for the problem nor an estimate of how long it would take to fix. This undoubtedly caused stress to students who were not familiar with computer technology in general, and online courses in particular. The clock was ticking down to an exam that was set to occur on Friday and they could not even start the course. I clearly missed an opportunity to explain that these types of inconveniences should be expected. Further I should have stated that a) I had taken the necessary steps to make sure that the problem was fixed as soon as possible, and b) I was flexible and would extend deadlines and reschedule exams if absolutely necessary to make sure all students had a fair chance in the course. Simple reassurances like these would have helped the students have confidence in my ability to address problems and help them gain confidence in their ability to effectively use this new medium by bringing problems to my attention. Instead, the first day dealt an unnecessary blow to their confidence in both the course and my abilities. Fortunately, that problem was fixed less than two hours later.

Another significant adjustment I made was to recognize that not all Internet access is created equal. Some students had fast T-1 access or cable/wireless modems and had no trouble accessing the materials. Other students were using borderline antiquated equipment (that is, 3-year old computers or older) and were suffering through disconnects, poor-quality video and extended download times. As the course progressed, some of the bolder students asked if they could have the lecture videos on CD-ROM and individual requests were accommodated. However, I had no idea that there were actually a number of students struggling through the course. That changed in the third week.

Although I didn't expect it, a student posted a critical comment asking if others were suffering in the Week 3 Frequently Asked Questions Conference (see “Net Congestion on RealPlayer!” thread). I decided to investigate the student's complaint by

sending a supportive message. I ended up instigating a ‘venting’ session. Although it wasn’t always fun to read, it had some beneficial effects. By allowing the students an opportunity to express some of their frustration, I became aware of some of the problems that they had been silently suffering through--at least they had been silent in their communications with me! I was also able to adopt some of their suggestions—like having a cell phone with me on exam days so that they could call with clarifying questions—and it gave them an opportunity to comment on their shared experiences. I was able to make some minor changes to the pace of the course, as I do in my traditional courses. My biggest regret was that it occurred after more than half the course was over. It is important to establish reliable communication with the class and seek feedback from the students.

In evaluating the learning outcomes of the course, there are several areas to address: student retention as measured by withdrawal rates, grade distribution, student satisfaction as measured by end-of-the course online surveys taken by the Office of Distance Education, and comments made by former students in the semesters following the course.

Demographically, the course enrolled 24 students, of which 13 were women and 15 were traditional DSU students (and hence were available to be informally interviewed in the fall and spring). 3 students dropped the course after the second week of class, for a withdrawal rate of 12.5%. In contrast, last summer I taught 20 students in a web-enhanced course using two-way interactive television with zero withdrawals, and last semester had 4 students out of 105 withdraw from both of the sections of principles of microeconomics I taught as web-enhanced courses. While small sample sizes are always problematic in these comparisons, this does lend some support to the claim that withdrawal rates are higher in ‘pure’ online courses.

Due in part to the availability of extra credit, the average grade in the course was 82 percent (instead of 78 percent in both the summer of 1999 and fall of 2000 sections).<sup>6</sup> However, the uncurved final exam score was 77%, well above the average in previous principles courses (Summer 1999 = 70%, Fall 2000 = 65%). Therefore, this suggests that

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<sup>6</sup> Exams are curved to 73-75 percent in my courses, but with 20-25% of the course grade based on ‘homework’ this causes the course grade average to increase to slightly higher than 75%.



the students in this course had a better understanding of the material. Of course, the exam questions were more difficult because it was an open-note, open-book test, which is not typical in my courses. Therefore, this is not a particularly valid comparison. The distribution was also significantly skewed in contrast to last summer with considerably more Bs and no D's in 2000. (Interestingly I had only one more A and the same number of F grades in 2000 than in 1999.) One might alternatively infer that there was an attempt to 'buy' good evaluations with a more generous grading policy on my part. Unfortunately even if that had been true, the students would have none of it.

16 students completed the student opinion survey for the summer class. My evaluations for this course were as low as they have ever been since I started teaching at Dakota State University five years ago. On a five-point likert scale (5 = strongly agree, 1 = strongly disagree), my evaluation scores ranged from a low of 2.3 ("The pace of the course was manageable") to a high of 4.545 ("Class participation was encouraged"). While only one question was ranked below 3.0, most of my other survey scores ranged from 3.2 to 3.9 in areas where I typically receive scores around 4.0 or greater. Evaluation results for selected questions are presented in Table 1 below.

**Table 1**  
**Student Perception of Instructor Effectiveness (Summer 2000, Summer 1999 and Fall 2000)**

SOS Mean Score (1 = Strongly Disagree, 5 = Strongly Agree)			
Instructor Evaluation Statement	Summer 00 (n = 16)	Summer 99 (n = 16)	Fall 00 (n = 84)
Instructor is interested in the progress of the students.	3.500	4.714	4.504
Presentation of the subject matter is effectively organized.	3.938	4.572	4.211
The pace of the course was manageable.	2.300	3.714	3.630
The instructor communicates knowledge of the subject matter.	3.250	3.917	4.452
Course objectives were presented and understood.	3.909	4.214	4.003
The instructor is willing and able to help me.	3.813	4.500	4.389
The instructor is fair.	3.500	4.214	4.255
Instructional techniques aided understanding of course content.	3.727	4.000	3.810
Computer projects/exercises helped me to better understand course content.	3.700	3.857	3.781

Due to the conflicting results--stronger results on objective exams, less satisfaction with the course and the instructor--I pursued additional feedback after the summer was over. I informally interviewed several students and asked a couple to submit written comments

regarding the class. In particular I asked students what they liked, didn't liked, and would like to see improved in the course. These are a sample of their comments:

### Likes

- "I was able to do my course work at any time during the day that was convenient."
- "I was able to work full-time and could participate in extra curricular activities during the summer"
- "I was able to complete the course in 4 weeks time and still have time to enjoy the rest of the summer."
- "I was able to take breaks any time I wanted to during the lecture videos or I could sit and watch 4 hours worth of lecture videos at a time."
- "I had my choice of what I like to do rather than a set time for all lectures."
- "I like how we were able to use our notes and book for each quiz and on the final exam. I think it made sense to be able to use your notes because that proved that you either did or didn't watch the lecture videos and if you did you probably took good notes."
- "Dr. Talley was always flexible when it came to problems with the Internet."
- "Dr. Talley would always allow ample time for us to finish our course work."
- "The presentation of the class material, excluding the technical problems, was excellent."
- "This class has met my expectations and I was very glad that it was offered as an internet class because I wouldn't have been able to take it otherwise."

### Dislikes

- "During certain times of the day, it was hard to get a good connection to the Internet to watch the lecture videos"
- "There was a lot of people that had a hard time with the course because we were learning a semesters worth of work in 4 weeks time, and you had to be prepared. I was not quite as prepared as I could have been but I was still able to get through the course."
- "The WebBoard was clumsy to use and slow."
- "Being an internet course, I had a little struggle with the communication of the course."
- "I think the course was well taught, but the course material was sometimes hard to receive."
- "Since I work full-time and am a single parent and go to school part time, it was very hard for me to make the time to watch these videos in between everything else. I would definitely not recommend this course to non-traditional students over the Internet."

### Areas for Improvement

- "Video and audio quality of the lecture material need to improve. Had a hard time hearing some of the material."
- "Overall, I feel that Dr. Talley has a very well organized class. As we have discussed during our class, some options for class may be extending hours to take the tests (since many students are non-traditional with an 8-5 or 40 per week job where there isn't enough time to all needed completed) and also extending the entire class session from 4 weeks to 8 weeks."
- "Daniel Talley is a good teacher, but for me 4 weeks of compacted study is too much."

#### **IV. Conclusion**

This paper examines some of the principles in constructing an online course in principles of economics. A major goal of the course was to use the Internet to increase the efficiency of the presentation of information to the students. In an asynchronous course, motivated students can control the course information so that it is delivered at their own pace. By making considerable Internet resources available to the students, a four-month course was reduced to 4 weeks. However, although the students demonstrated that they could successfully learn the material, the course produced additional stresses that resulted in a reduction in the satisfaction of the students.

The course served to illustrate some of the advantages and disadvantages of Internet instruction. As has been discussed, the Internet can be a powerful tool for sparking student interest in the material. There are precious few activities I am willing to do voluntarily for four hours straight, yet several times students commented that they were glad to be able to study the material for many hours at a time. I believe this is, at least in part, a testament to the power of the medium to engage the students. And remarkably this occurred using relatively passive 'streaming video' technology, as opposed to active learning techniques.

The Internet also lets the student take responsibility for their learning. If they are not doing well, it is their responsibility to contact the instructor, other students, or seek help online. The students did not complain about a sense of isolation; in fact some of the students seemed to have developed a sense of "esprit de corp"; that they were in this together and would have to suffer thru the technical problems jointly. Of course, DSU students are also indoctrinated to at least tolerate, if not become actual enthusiastic users of computers (and by extension are used to computer problems!), so these attitudes may not be representative of less technologically astute (or tolerant) students.

Of course, disadvantages were also present. At the start of the course, this instructor did not have an effective back-up plan in case the network failed (or was slow). It would have been easy to make available CD-ROMs containing the lecture videos and materials at a small cost for those students with inferior Internet access. If the server had crashed and been down for more than a few hours, then the students would have needed an alternative method of viewing the lectures. In a course compressed to a mere four

weeks the loss of two or three days at the end could have proven to be an extreme inconvenience, perhaps resulting in a mass of incomplete grades for the course. Technical difficulties will inevitably arise—plan for them.

And finally this course design relied too heavily on the lecture video presentation method. The course needs to incorporate more active learning strategies so as to address the needs of a wide variety of students. It was clear that non-traditional students in particular were not able to adjust to the pace of the course and the high rate of assimilation of the material. Their schedules were not sufficiently flexible to permit them to take advantage of the efficiencies of the Internet in transmission and they needed time to let the material ‘sink in’ before being evaluated. Clearly more time between examinations would allow students without large blocks of study time to gradually study the material and contemplate the concepts. As noted in the discussion board, some students had to take vacation time from work in order to complete the course requirements. While perhaps some of this is the result of differing perceptions of the workload for a “4-week summer course,” in the end it is the instructor’s responsibility to establish clear expectations for the courses workload.

In general, Internet courses require more active learning components than traditional classroom courses. Students must be guaranteed reliable access to the instructor and preferably to fellow students as well. Clear expectations and lines of communication must be established or some students will begin to feel detached and isolated. I suspect it is this isolation that contributes in part to the higher withdrawal rate in Internet courses. Active learning techniques that promote collaborative discussions, group projects, simulations, exercises, and other interactive approaches to the material would help involve the students in the learning process and make them feel a part of the group.

In addition, I have found that it is very important to provide feedback, mentoring, and facilitation in working with the online students. They need to know where they stand, what they need to do, and they can go about accomplishing the requirements of the course. They will tend to look to other students for guidance, so any techniques that facilitate student-to-student contact will likely improve course outcomes. I look forward to adopting more such techniques in the online courses I teach in the future.

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