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## **Lessons Learned from Developing and Offering a Web-Based Course on Futures and Options**

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### **Introduction**

Distance education technologies are becoming more widely used in baccalaureate and post-baccalaureate programs in both the private and public sectors. Several land grant institutions in the western region are giving consideration to (or are actually offering) off-campus agribusiness-oriented degree programs using a variety of distance education technologies, including web-based coursework. Examples include the University of Idaho (UI) with an off-campus undergraduate agribusiness degree program in Idaho Falls<sup>2</sup> and Kansas State University's Master of Agribusiness program.

Web-based instructional technologies seem to have distinct advantages relative to other distance education delivery alternatives, especially regarding delivery cost and accessibility. If properly designed, web-based courses can be accessed at just about any location, and are conducive to sharing coursework across institutional boundaries. Although the economics literature has discussed online courses (see Vachris 1999 or Brown and Liedholm 2002 for examples), there has been limited discussion about issues related to developing and delivering web-based instruction within the agricultural economics profession in the western region. The primary objective of this article is to share one instructor's experience developing and delivering a web-based course on a common topic for agribusiness-oriented degree programs (futures and options). Secondary objectives are to suggest some other possible applications of similar web-based courses, and encourage some additional sharing of information on issues related to web-based courses.

### **Course Description**

The course (AgEcon 489) is a web-based course designed around the WebCT platform<sup>3</sup> and is offered for two credits each spring semester at the University of Idaho. To coincide with a 16-week semester, the course is comprised of 16 learning modules (Week 0 is a course orientation, and Week 15 is a course summary and final review). Each module must be completed over a designated one-week period beginning Monday at 8:00 am and ending Sunday at 11:55 pm. The learning modules are typically composed of four lectures averaging about 15 minutes each, and are presented using a narrated Powerpoint format. Each weekly module is supported by a weekly threaded discussion activity. Two questions, based on issues relevant to the week's lecture material, are initially posted by

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<sup>1</sup> The author is Professor, Department of Agricultural Economics and Rural Sociology, University of Idaho. Appreciation is expressed to the two anonymous reviewers for their helpful comments on this article. Development of this course would not have been completed without the assistance of Educational Communications, College of Agricultural and Life Sciences, University of Idaho.

<sup>2</sup> The University of Idaho's Agribusiness program in Idaho Falls is currently seeking permission from the Idaho Higher Education Board to discontinue the program. Reduced enrollments after BYU Idaho (formally Ricks College) began offering four-year degree programs, and reductions in departmental teaching resources are the primary reasons for eliminating the program.

<sup>3</sup> WebCT is a commercial product providing a platform for organizing web-based courses. Two common platforms are WebCT and Blackboard, which have recently merged. At the UI, WebCT has been purchased and is maintained at the university level.

the instructor. As suggested by Greenlaw and DeLoach (2003), “interpretive questions” are used to encourage critical thinking in the student responses. Additionally, a one-hour chat session is offered at two separate times during the week. Chat sessions are used to provide students the opportunity to ask questions about homework assignments, lecture materials, and administrative details associated with the course. Questions from students are generally limited, and most of the chat session time is used for class discussion. Subject matter questions are directed to a specific student, and the class then discusses the answers provided.

Both discussion formats are required and evaluated for both quantity and quality as part of the course grade (10% of the final grade). All prior weekly lectures, discussion sessions, and chat logs can be revisited at any time during the course. However, all graded activities must be completed during the designated one-week time period.

Non-graded student assignments include a weekly homework (a key is provided for self-grading the homework), and a self-graded fun activity (typically a crossword puzzle to encourage terminology development). The only consistent weekly graded activity is an online quiz the students may take up to three times, with the highest grade recorded. Weekly quizzes are composed of 10 questions (four-option multiple choice) randomly drawn, with replacement, from a bank of 50 questions. Weekly quizzes are automatically generated, monitored, and graded in the WebCT platform and represent 30% of the final grade. Extra credit assignments are offered three times during the semester, and submitted using the WebCT assignment submission procedure.<sup>4</sup>

Other graded activities include an eight-week futures trading activity using an online futures trading simulation (TradeSim), a paper explaining the student’s futures trading strategy, and two proctored examinations (a midterm and final). The trading activity accounts for 10% of the final grade, and the proctored examinations account for 50%. Other than supervising the proctored exams, the course is entirely web-based and offered to on- and off-campus students.

### **Course Development**

Development of the course was initiated in the fall and spring of 2002/03 while the instructor was on sabbatical leave. Three web-based courses focusing on distance education (all three are offered by a major online learning network), were completed by the instructor in the fall of 2002. The courses focused on planning and design of a web-based course (Boettcher and Conrad 1999; Draves 2002; and Horton 2000). Planning and design of the course structure were completed by late fall of 2003, supported by a significant time commitment (see Table 1) from a web-design specialist from the college’s Educational Communications department.

By early January of 2004 (when the course was initiated for the first time), three weekly modules were fully prepared. Although the instructor has taught futures and options as part of an undergraduate marketing course for several years, this was a new course focused entirely on futures and options. Thus, the development process involved a new course as well as a web-based course. This becomes important in the forthcoming discussion of the time required for course development. The remaining 13

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<sup>4</sup> One reviewer questioned whether the course was designed around WebCT’s capabilities, or if the course was designed and WebCT was able to incorporate all of the learning activities. The course was designed recognizing WebCT as the supported and available delivery platform, therefore the learning activities were adjusted to fit. Learning activities are similar to what this instructor would use in a traditional course (weekly quizzes, class discussion, a written paper), and all can be accommodated using WebCT with some obvious adjustments such as quiz format and lack of a proctor during online quizzes. Perhaps the issue cannot be clearly addressed except to recognize that any choice of learning activities has to adjust to the delivery format, whether traditional or distance. So the issue may really be about the degree of adjustment.

course modules were completed as the course was being offered for the first time in the spring of 2004. Each weekly module involved: 1) putting together the week's outline of activities; 2) creating and narrating the Powerpoint slides for the four lectures; 3) writing a 50-question test bank from the week's lecture material; 4) developing the homework with a separate answer key; and 5) producing the fun activities and printable handouts. For the initial course offering, all activities associated with converting files to the necessary format and placing these files into the WebCT platform were done by the web-design specialist. Most of the homepage and navigation material is programmed in html, the narrated Powerpoint files are converted for web presentation using media software<sup>5</sup> and other materials are in Word or pdf format.

Development time for the course was significant. Table 1 provides a summary and comparison to a traditional course. Initial planning and design of the course, and developing the first module (Week 0) consumed about 175 hours of instructor time, and 50 hours of web-designer time. Developing the additional weekly modules varied from 25 to 40 hours of instructor time, depending on instructor familiarity with the week's content. An existing textbook on futures and options was used (Purcell and Koontz 1999). Course content follows the textbook (covering chapters 1-5, and 7-12), with examples being more Pacific Northwest focused. The average amount of instructor development time is estimated at 32 hours for each weekly module. Web-designer time for converting the files and placing materials on the WebCT platform was about six hours per week. To give some perspective, the author estimates planning time for a new undergraduate course with a good textbook to be about 80 hours of initial planning and development effort. Additionally, about 15 hours of preparation time per week would be expected.

**Table 1.** Initial design, preparation, and maintenance time for distance course compared to author's estimate of a similar traditional face-to-face course.

<b>Instructor:</b>	<b>Distance Course</b>	<b>Traditional Course</b>
Initial Design (total hours)	175	80
15 Weekly Modules (avg. hours/week)	32	15
Weekly Maintenance (3 <sup>rd</sup> semester) <sup>a</sup>	5	4
<b>Web Designer:</b>		
Initial Design (total hours)	50	
15 Weekly Modules (avg. hours/week)	6	
Weekly Maintenance (3 <sup>rd</sup> semester)	0.25	

<sup>a</sup> Weekly maintenance does not include preparation time before the semester begins, which is about the same for both courses (15 hours). Weekly maintenance time does not include delivery time for either course, which is about 3-4 hours for both course formats.

### **Course Maintenance and Delivery**

The third offering of the course occurred in the spring 2006 semester. Annual updates are necessary, but require less time with each offering. When the course was initially developed, examples often included a specific date that was mentioned during the narration. Using current and specific dates adds a sense of relevance to examples. In a regular course, the effort required to include (and subsequently update) current dates is generally considered a worthwhile effort. However, updating the narrative on a series of Powerpoint slides takes significant effort. Altering the narration of single slides is difficult, and the entire lecture often needs to be redone. Several lectures had to be changed and re-narrated when the course was offered the second time. Text changes (such as dates) can easily be inserted in the

<sup>5</sup> The specific program used is Impatica. The program is easy to use, and relatively inexpensive to purchase for the basic version. Narrated Powerpoint files are very large, and Impatica is used to compress the files and provide a video-style delivery format (stop, start, pause, go back one slide, etc.).

narrated slides if not specifically discussed in the narration. Although this requires time, the process is much less time consuming than re-narrating the entire presentation. During the second offering, care was taken not to mention specific dates in the narration. For the third semester, course maintenance required about 15 hours before the semester started, and about five hours for each weekly module.

The instructor (clearly not a computer wizard and born well before the computer generation) is now able to complete virtually all the file maintenance with limited technical help. Files that need continuous updating for the course are primarily in Word and pdf formats. Narrated lectures are edited as Powerpoint files, and then converted to a media presentation format. Most of the homepage and navigation files for the course (which need limited updating) are html files. The instructor's lack of html programming skills means that efforts to edit these files occasionally go awry, and technical assistance is required to correct the mistake. There are several programs that edit html files that could be used. However, the original programmer used fairly complex web pages and conversion would take a significant amount of time.

Course delivery involves preparing for and conducting two one-hour chat sessions per week, updating and responding to the discussion board, and responding to student emails. The two chat sessions per week meets the different time availabilities of both on-campus and off-campus students, and keeps the chat sessions under 12 students per session. The discussion board questions are posted at the beginning of each week, and the instructor monitors the discussion board daily. Instructor responses to discussion board comments are posted as appropriate, and a wrap-up for the week's discussion questions is posted at the end of the week. Students email the instructor with questions and issues related to the class, and three emails are sent to students each week as reminders of what is going on in the course. Two proctored examinations are prepared and given during the semester. Total time for course delivery (separate from course maintenance) is estimated at four hours per week.

### **Student Performance and Course Evaluations**

Class size has been relatively small, but seems to be growing. Fourteen enrolled the first semester the course was offered (11 completed), 16 enrolled with 12 completions for the second offering, and 19 students enrolled with 16 completions for the third offering (spring 2006). For the 11 students completing the course the first semester, the grade distribution was: A=4; B=2; C=4; and D=1. The grade distribution for the second offering was: A=6; B=3; and C=3. The third semester had a grade distribution of: A=3; B=7; C= 5; and D=1. Grade point averages for the three semesters were 2.82, 3.25, and 2.75, respectively. These average GPAs are within the range for a traditional upper-division course taught by the instructor, although 3.25 is certainly at the upper end of that range.

A pre-test and post-test procedure is used for the course. During Week 0 of the course, students are required to take an on-line examination using 20 randomly drawn multiple-choice questions from a test bank of 130 questions. During Weeks 14 through 15, students take a post-test involving 20 questions from the same question bank. Pre-test averages for the three semesters were 50.5%, 52.5%, and 42.7%, with post-test averages of 78.8%, 82.5%, and 85.3%, respectively. Thus, the percentage point increase in performance was 28.8 for the first semester, 30.0 for the second, and 42.6 for the third offering. A comprehensive study comparing traditional and online class performance in MBA statistics and managerial economics courses was conducted using data from the University of Wisconsin-Whitewater. Although pre- and post-test scores were not the focus of the analysis, averages reported for both suggest similar levels of improvement in both courses (Anstine and Skidmore 2005).

Customized on-line student evaluations are required for all courses offered by the UI, with two generic rankings assigned to all classes (overall instructor and overall course) on a four-point scale. Instructor rankings for the two offerings of AgEcon 489 were 3.8 and 3.6 for the two offerings, respectively, with the overall course rankings at 3.6 and 3.8. Departmental averages for all courses during the same semesters were: spring 2004 = 3.6 for instructor and 3.6 for course; and spring 2005 = 3.6 for

instructor and 3.6 for overall course. Course evaluation data for similar-sized upper division courses and for the spring 2006 course are not unavailable at this time.

### **Future of the Course**

The course is being improved based on the experiences from previous offerings. Some of the lectures are too long (up to 25 minutes), and need to be shortened. Fifteen minutes is likely a good target for lecture length.

Chat sessions are an effective and enjoyable forum for discussion, but need to be well structured and limited to about 12 students. Review questions need to be more carefully developed before the chat session starts, and the questions need to be designed to both reinforce critical concepts and stimulate additional discussion. Putting more effort into developing appropriate questions to better engage students would improve learning from the chat sessions. Threaded discussion boards have also been effective for this course, but more effort needs to be focused on developing appropriate questions and assessing the quality of student postings. Current evaluation is primarily focused on quantity, and better assessments of quality are possible and important to encourage critical thinking as suggested by Greenlaw and DeLoach (2003).

Both discussion formats (which are a part of the course grade) suffer from a timing problem, because students tend to do most of the course work toward the end of the week (generally Saturday and Sunday). As the course is currently structured, chat sessions are Thursday and Friday, and students have likely not covered all of the week's material before the chat session. Perhaps moving the chat session to the forthcoming Monday or Tuesday after the week closes on Sunday could improve the caliber of student input. A similar problem exists for the discussion board, since students tend to post their comments over the weekend. The instructor then responds on Monday morning, after the week is essentially over. Making the posting deadline Friday at noon seems like the logical solution to this issue. However, students may not be prepared to make good discussion comments about the week's material by Friday. Since both discussion venues represent a small part of the final grade, increasing the importance of and upgrading the evaluation of both discussion formats may improve the quality and level of student participation.

Plans are to continue offering the course for the near future. The off-campus programs offered by the UI are currently being reviewed, and may be discontinued. If the course serves only on-campus students, then a traditional face-to-face course seems more likely. The web-based course takes more time than a traditional course, and is less favorably received by on-campus students than a traditional course. Two possibilities are being considered for expanding utilization of the course. The subject matter is of interest to a traditional extension audience and other agribusiness professionals. Thus, the course may be re-designed and offered as a non-credit educational opportunity for extension audiences or as continuing education credit for professional organizations.

Sharing the course with agribusiness programs at other educational institutions seems possible. Many programs are experiencing resource constraints, especially with regard to teaching resources, so exploring opportunities to share resources makes sense. Institutional barriers to sharing courses exist, but such sharing has been done between Idaho (UI), Washington (WSU), and Oregon (OSU), albeit with both successes and challenges (Anderson, Makus, and Fanno 1998).

### **Lingering Lessons from the Experience**

The instructor's initial fear that this whole idea was a potential technological disaster waiting to happen was without foundation. The technology is manageable, even if you are computer challenged. Assistance will likely be needed during the initial course development, but the need for help is limited during additional offerings of the course. Students take surprisingly well to computer-delivered instruction, and have not expressed any major frustrations with the technology. The course seems to

work well even for those students with low speed internet access. The technology appears to be exceedingly reliable, and surprisingly tolerant regarding the abuses of a novice. A major technology failure has not occurred in three semesters of offering the course.

The process has the potential to be an effective way to deliver educational content to students. The instructor has become a believer as a result of this experience, and is impressed well beyond initial expectations. The course can be improved, the technology is changing rapidly, and students (on-campus and off-campus) are becoming more receptive. Student learning takes place, the process is more enjoyable than one might expect, and there are opportunities to extend such courses to other audiences. Web-based instruction at the university level will likely continue to grow in the future, and all disciplines should be prepared to respond.

If the course were used only for on-campus delivery, the time required for development and delivery is prohibitively high. Based on this experience, the time commitment approaches twice what it would take for a traditional face-to-face course for development time. Delivery and maintenance times are similar. Thus, if a more efficient way to deliver courses for on-campus students is the goal, web-based courses may not be the answer. However, if there is a need to serve off-campus students or share course offerings between campuses, web-based instruction may be an excellent approach.

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