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**Teaching Intermediate Microeconomics as a Web Based Course: A Case Study of
the Integration of Available Instructional Technologies**

Yvonne Jonk, PhD

Health Economist
Center for Chronic Disease Outcomes Research
Minneapolis VA Medical Center
One Veterans Drive 1110
Minneapolis, MN 55417

Assistant Professor
University of Minnesota
School of Public Health
Division of Health Services Research and Policy
420 Delaware Street SE, MMC 729
Minneapolis, MN 55455

Adjunct Assistant Professor
Southwest State University
Marshall, MN 55455

Presented at the 2002 American Agricultural Economics Association Meetings
July 28-31, 2002
Long Beach, California

Abstract Summary

The feasibility of teaching intermediate microeconomics as a web-based course to non-economics majors and the integration of several instructional technologies are presented. The lack of face to face interaction with the professor discourages undergraduate students from learning and appreciating economic theory, and may dissuade students from exploring the field.

Introduction

The purpose of this study was to evaluate the feasibility of teaching intermediate microeconomics as a web based course to non-economics undergraduate majors, and to describe the integration of several instructional technologies used during the course of a semester. Students majoring in the Agricultural Industries and Marketing (AIM) at Southwest State University (SSU), Marshall, Minnesota, were required to take this course in conjunction with that taught and required on the Twin Cities University of Minnesota (UMN) campus. The course was contracted out to an adjunct professor who taught the course on the UMN campus. The results of this pilot study will serve to guide future efforts in offering this course to students on the SSU campus.

Study Design

The class was initially designed as a web-based course with a two to three hour recitation period once a week. The class' format was significantly modified in three stages as the semester progressed. These stages were as follows:

- 1) students were to review the material on their own through the web and meet once a week on Tuesday evenings to address problems and homework exercises,
- 2) help sessions and additional office hours were incorporated using Microsoft's NetMeeting, and
- 3) interactive television (ITV) sessions were incorporated once a week on Thursday evenings.

More specifically, PowerPoint slides based on Varian's Intermediate Microeconomics textbook (Liu, 2000) were initially developed to replace the traditional classroom "chalk and talk" lecture format and were made available for viewing on the class's home page located on the University's website. Students were required to review these slides and read Varian's textbook on their own before coming to a two hour recitation period once a week. The first hour of the recitation period was devoted to answering questions related to assignments and readings, and the second hour was devoted to going over sample problems that pertained to the next homework assignment.

Four weeks into the semester, students maintained contact with the professor through email and the professor started holding on-line office hours using Microsoft's NetMeeting software. Students downloaded this free software from Microsoft's homepage on their own and logged onto the professor's host site once a week and/or on an as needed (per request) basis.

Finally, the professor presented lecture material through interactive television (ITV) sessions once a week on Thursday nights during the last half of the semester. This venue was also used to hold a review session for the final exam.

Students were given assessment forms throughout the semester to monitor their progress and satisfaction with the course. An 18-item follow-up survey questionnaire was sent to the students by email three months after the semester course ended. Thirteen of the 14 students responded, yielding a 93% response rate.

Population Studied

Non-economics majors in their junior and senior years of college were enrolled in an agriculturally based business curriculum and were required to take intermediate microeconomics. A web based course, taught by an adjunct professor, was offered as a means of satisfying this requirement. All 14 students had met the prerequisites of principles of microeconomics and one semester of either pre-calculus or calculus. As the course was required, self-selection was not a problem in assessing the students' experience.

Prior exposure to web-based courses

All of the students have taken at least one of their courses at their major university through interactive television (ITV) prior to taking Intermediate Microeconomics. Just over half of the students (54%) have taken at least two ITV courses. This contrasts to a vast majority of the students (85%) who have not taken a web-based course prior to taking EC315. Only two of the 13 students claimed to have taken one or more web-based courses.

Principal Findings

The use of the class' home page to facilitate viewing the PowerPoint slides and the use of email to contact the instructor if questions or problems arose were initially embraced by the students as an effective means of communicating class lecture material. Using a five point Likert Scale (Excellent, Very Good, Good, Fair, & Poor), nine of the 13 students (69%) rated the accessibility of the power-point slides and the information made available on the class' home page as "Good". Two of the students rated the accessibility of the information on the class' home page higher than average, while two students rated the information as "Fair".

In response to the students' request, students were given paper copies of the PowerPoint slides to enhance their ability to take notes and follow the slides along. Approximately two-thirds of the students (62% or eight of the 13) considered it very important to have a paper copy of the slides, while the remaining students rated having the hard copies as either important or they were indifferent to having them. Those considering it very important/important (85%) were willing to pay the cost of the materials (\$30). Only two students were not willing to pay the full cost, and expressed that they would be willing to pay (at most) \$10 and \$20 respectively.

Incorporating Microsoft NetMeeting

Four weeks into the semester, the use of other on-line resources, namely Microsoft's NetMeeting software, was incorporated into the class' regular meeting times on Thursday evenings as a means of enhancing communication that was otherwise occurring through in person recitation periods on Tuesday evenings and via email correspondence. This software enables users to log onto a central host location (i.e. IP address), and correspond with the instructor either through audio, a chat room, video, and whiteboard. Although the software was pilot tested via the instructor and a student volunteer prior to hosting a multiple user conference, the software performed well during one-on-one sessions, but could not effectively handle multiple users logging in and sending messages through either audio or through the chat room. Problems were

encountered by sequence. The first person logging on could hear the instructor, and the instructor could hear them, but anyone subsequently logging on to the site could hear the instructor, but could not talk to the instructor or anyone else. Although all users were able to correspond by typing in messages to the chat room and drawing graphs in the whiteboard window, this method of correspondence was both awkward and time consuming, and resulted in an inefficient use of everyone's time. As a result, the instructor resorted to using NetMeeting software as a means of holding office hours via one-on-one sessions with individual students on an as needed basis.

Of the eight students participating in the NetMeeting calls, the majority of them (63%) rated the use of this software as "Fair" on the five point Likert Scale. Three quarters of the students expressed dissatisfaction with the use of this software as a means of communicating with the instructor and getting help when needed.

Incorporating Interactive Television (ITV)

As the semester progressed, the conceptual difficulty of the material required more face to face interaction between the students and the professor, and necessitated facilitating the use of interactive television help sessions/lectures that further enhanced the material presented on the PowerPoint slides.

Overall Satisfaction with the Class

The students' overall satisfaction with the class was monitored throughout the semester and is reported for each of the three developmental stages. For the reader's convenience, these stages again were: 1) students were to review the material on their own through the web and meet once a week to address problems and homework exercises, 2) office hours were incorporated using Microsoft's Netmeeting, and 3) interactive television (ITV) sessions were incorporated on Thursday evenings.

The majority (over 75%) of the students expressed some dissatisfaction with the class meeting only once a week and reviewing the class' lecture material on their own through the web. The incorporation of NetMeeting resulted in a 5% gain in overall satisfaction with the course. Prior to incorporating NetMeeting, less than a quarter of the students were satisfied with the format of the class, while after incorporating NetMeeting, approximately a third of the class expressed satisfaction with the format of the class. The use of the ITV sessions resulted in a significant 52% gain in the students' overall satisfaction, with just over 77% of the students expressing that they were either satisfied/very satisfied with the format of the class.

Eighty-five percent of the students stated that they would have preferred the traditional "chalk and talk" classroom setting to having taken this web-based course, and noted that because of the complexity of the material, they would have learned more if the class had met two to three times per week. While over three-quarters (77%) found the course very challenging academically, over half of the students felt that the amount of material covered in the course was below average. This figure may be biased upward, as the instructor had commented that the amount of material covered was less than that covered in comparable classes taught in the traditional classroom setting.

Eleven of the 13 students felt that it was important that the instructor held office hours before the Tuesday evening recitation periods, and sought help during this time. About half of the students sought help on assignments or class material from in-house

university professors other than their primary instructor, thus illustrating the importance undergraduate students place on being able to discuss and validate their understanding of economic concepts with their professors.

Ten of the 13 students stated that they would not recommend or advise their classmates to take an intermediate level microeconomics course as a web-based course, and all of the students were either discouraged (31%) or indifferent (69%) to taking more economics classes and further exploring the field of economics. Although the students' indifference to taking more economics is significant as stated, their indifference to the field may, in part, reflect a lack of enthusiasm for the subject material prior to taking the course.

Conclusions

Teaching intermediate microeconomics as a web based course to non-economics majors requires that professors have the resource capacity to call upon other instructional technologies such as NetMeeting and interactive television to ensure that undergraduate students have a positive experience. The lack of face to face interaction with the professor when teaching web based courses appears to discourage undergraduate students from learning and appreciating economic theory, and ultimately, may dissuade students from exploring the field of economics.

References

Liu, Donald J. Instructor's Lecture Notes on Applied Microeconomics: Consumers, Producers, and Markets. Lecture Material: No. DJL 99-1, Version 3.0.