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INNOVATIVE TECHNOLOGIES In Teaching and Outreach

Instructional Technologies:

CALS Initiatives and Innovations

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Introduction

Emerging information technologies and online resources have had tremendous impact on how faculty and staff in the College of Agriculture and Life Sciences (CALS) deliver educational services and information. CALS has long been considered a leader and innovator in the use of instructional technologies and the World Wide Web.

Dr. J. L. Oblinger, the new Dean of the College of Agriculture and Life Sciences, recently stated that agriculture and life sciences must remain in the forefront of the technological revolution. "As the information age enters its maturity, new professions will emerge," he said. "New technologies will change the way we live, work and learn, and will bring unforeseeable opportunities and challenges. As a college, we must remain at the forefront of these changes to assure that our research, teaching and extension activities remain relevant to the needs of our students and the people of North Carolina." Mike O'Kane, Coordinator of the college's Office of Administrative and Instructional Computing adds: "The college is positioning itself technologically to participate in an increasingly global educational environment."

Nowhere has this been more evident than at the recent 2nd Annual NC State University Instructional Technologies Expo, held on September 24th. More than 26 faculty and staff members showcased examples of innovative uses of instructional technologies and outreach efforts. Highlights of exhibit booths included Dr. Alice Russell's "Consumer Horticulture on the Web," Ted Feitshans' "Teaching Law on the Web," Dr. Pat Curtis' and Melissa Taylor's "Food Safety Education on the Internet" and Dr. Rich Cooper's "Grass

Classes for the Masses: Teaching on the World Wide Web." In addition, the CALS Office of Administrative and Instructional Computing hosted an exhibit booth with multimedia demonstrations on topics such as digital photography, streaming Real Audio, and creating Adobe Acrobat files.

Many NC State University offices, NC State Computing Services, and CALS administration, faculty and staff work together to facilitate an environment that ensures that CALS continues to be at the leading edge of developments in online teaching and outreach learning. Not only are faculty supplementing their courses with material on the World Wide Web, several CALS faculty are delivering their courses completely over the Web, as part of "Project 25" the first coordinated campus-wide effort to support online education at NC State. The CALS Project 25 courses provide a rich and interactive environment, with instructors incorporating audio, video, and other multimedia components into their courses.

CALS Courses Delivered on the WWW

There are six courses in CALS delivered completely online this fall. Several of the faculty were consulted to share with us some of the course highlights, and their experiences teaching on the World Wide Web.

ALS ZO495: Special Topics (Introduction to Histology), taught by Betty Black, contains vivid images, audio and video clips. Writing assignments and quizzes are handled online. "The online quizzes are a self-help tool, provide instant feedback, and ensure that students keep up in the course," Dr. Black says. The weekly on-line lessons in this course utilize both audio and video—the audio is comparable to the lecture portion of a standard course, but is given in 30-60 section bits in conjunction with specific images. Although students take the course online, they meet three times during the semester for major exams in a classroom setting. NetForum facilitates class discussion.

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Emerging Technologies for the College of Agriculture and Life Sciences

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Dr. Richard Cooper's Project 25 Course, CS 021: Turfgrass and Their Uses, has an enrollment of 46 students. The course syllabus includes lecture notes, diagrams and images. CS 021 has scheduled weekly labs, and students taking the online course are placed in the same lab. Questions and assignments on course material are made available throughout the semester using the course "Bulletin Board" feature and/or email. Dr. Cooper found that on the first exam, the web students scored very close to the students taking the traditional course.

Delivering courses over the World Wide Web provides a teaching environment that is not constrained by time or place. However, it goes without saying that designing a course on the Web takes a significant amount of time and resources. At the end of the fall semester, CALS faculty will have a clearer idea of what works well and what doesn't, and what additional infrastructure is needed to deliver distance education courses.

Technology for Teaching Faculty: Support and Services

Currently, CALS has approximately 90 courses on the World Wide Web, at the 2nd year, 4th year, and graduate level. Many of these display innovative uses of instructional technology. For example, Tom Johnson, of Agricultural and Resource Economics/Statistics is adding compressed voice to PowerPoint presentations, using two popular tools, ToolVox and Cool Edit. John Meyer's ENT 425: General Entomology, uses Javascript online tests. HS 211: Ornamental Plants I, taught by Paul Fantz, provides hot links to web booklets developed by Dr. Alice Russell.

In addition to combined university resources, faculty and staff may draw on the resources provided by the CALS office of Administrative and Instructional Computing. These resources include training, development tools, and computing services that faculty/staff can use to develop instructional course components. These services, and future developments, will facilitate new methods and techniques for the delivery of educational services.

Conclusion

There will continue to be a growing demand for "just-in-time" learning opportunities, and time-and-place independent learning. CALS faculty and staff have made significant achievements in using the web in education, and will continue to experiment and move forward as they make innovative use of new instructional technologies. As CALS progresses into a global educational marketplace, we will continue to see new and exciting learning opportunities.

Integrating the Computer and Classroom *Herman Sampson, Lecturer Agricultural and Resource Economics*

Faced with accelerating demands from a high-tech world, NC State University students must be able to learn, discover, explore, and acquire knowledge in a variety of ways. In the past, students relied primarily on classroom lectures, memorization, and laboratory experiments to acquire understanding about a topic or subject. In the modern college environment of today, however, teaching methods and learning skills are enhanced with the use of multimedia classrooms, student use of a personal computer, and access to the Internet. In the fall of 1995, the Department of Agricultural and Resource Economics, the College of Agriculture and Life Sciences, and I made a serious commitment to integrating the use of computers with classroom instruction through a redesign of the introductory economic principles class, ARE 012: Introduction to Agricultural Economics. This course is available to students who are enrolled in the two-year Agricultural Institute program. All lecture material is available to students via remote access from a computer. Lecture information is prepared using spreadsheet, word processing, and graphic software so content is user friendly for students. Enrolled students are required to subscribe to a common mailing list (called "listserv") so that homework assignments, required reading material, and relevant news articles are disseminated to students quickly and easily. The classroom listserv allows the instructor to send the same information and announcements to every class member with just a few clicks of a computer mouse button. Students can also ask questions or interact with their peers using the listserv as well. Through use of listserv, students learn to use the computer and become familiar with various types of software on a regular and repetitive basis. In ARE 012, assignments require students to use the computer outside of the classroom in order to complete homework assignments.

Since that fall of 1995, use of the computer in the classroom evolved into establishment of two specific web sites for the ARE 012 course. The first web site (<http://www2.ncsu.edu/ncsu/cals/course/are012/intro.html>) contains supporting resource materials for the course and the classroom instruction. The other web site (<http://courses.ncsu.edu/ARE012/index.html>) is a distance education course. The distance education

The World Wide Web creates new opportunities for Extension Services

web site is for use only by "registered" students for the course, but the first web site contains similar information as the distance education course and is available for inspection by anyone with a computer, a modem, and internet access. I invite you to visit the course site with your web browser. Please feel free to provide comments concerning the web site and its content by e-mailing

Herman_Sampson@ncsu.edu or using the anonymous feedback form available to students. Students often use this form to tell me to slow down and make the tests easier.

Currently, several students are using the distance education site to help coordinate their personal schedules with the classroom schedule. For example, one student must work on Fridays and would miss class each Friday afternoon. With the distance education site, the student is able to obtain the lecture and any information he may have missed during class from his home computer at a time that is convenient. The student also has ready access to the instructor via e-mail or telephone contact.

Both web sites contain an enormous amount of information and links to resources that would be very difficult to provide to students in any other format. The course syllabus and lesson material outline are provided as a PDF file, as well as an HTML presentation to assist students in developing a system of study for the course. All course assignments and due dates are posted to the web as well, so there is really no excuse for students not to get their assignments or to know when those assignments are due. A collection of old exams is just a mouse click away for students to examine and use to study. Thus, there is no reason for a student not to know what to expect when exam time rolls around. In addition, lecture notes are available on the web to students so that they can review the lecture and glean material they may have missed during class. I refer to homework exercises as practical exercises, and "help sheets" for most practical exercises are available on the web for students to use if they run in to trouble. A list of supplementary readings is available as well. Copyrighted articles are stored in D.H. Hill library's electronic reserve room that only admits registered students. A listing of other interesting web sites is provided to students on the web site under "course-related online resources," and useful campus web resources are provided as well. Eventually, all of the North Carolina crop budgets will be available to students via this web site too.

Students often ask specific questions that naturally interest other students. Frequently these questions require more background information and class time than an instructor wishes to dedicate to answering. The web allows an instructor to respond in detail by providing specific information in response to these types of questions. The

"Unemployment Data" link and the "Public Assistance Information" link are two examples of this type of timely response. I hope you stop by, and I look forward to hearing your thoughts about what we are doing to integrate computer technology into our instructional pedagogy.

The World Wide Web Opens New Opportunities for Outreach Education

Ted Feitshans, J.D.

*Extension Specialist and Lecturer
in Agricultural and Environmental Law*

Extension services were created to address the educational needs of farmers and others who were isolated from traditional learning centers. The development of the World Wide Web has made a vast amount of information available to virtually everyone with an up-to-date computer and a modem. Does this mean that the Extension educator is obsolete, can hang up the car keys and retire? Hardly! The World Wide Web offers exciting new ways to deliver Extension education programs.

The World Wide Web is particularly well adapted for delivering a variety of directory and reference information. Several ARE faculty members, myself included, have developed a Web-based reference of federal and North Carolina laws and regulations that affect water quality. This document is located at http://www2.ncsu.edu/ncsu/cals/ag_rec/Water/INDEX.HTM, under the title, Regulations Affecting Water Quality, Agriculture, and the Environment: A Primer. This document contains over one hundred and forty entries. Each entry lists the common name of the statute or regulation, an appropriate cite, a brief description of the law or regulation, a description of the regulated community, and the agency responsible for enforcement or administration of the law or regulation. A telephone number is listed for each regulatory agency. In our next update of the Primer, we plan to add links to regulatory agency Web sites.

The Web is also a wonderful means for delivering information about new developments. David Crouse, an extension specialist in Soil Science, and I have three publications about the new animal waste management regulations on the Web. These may be found at <http://ces.soil.ncsu.edu/soilscience/publications.htm> under Soil Notes.

Even traditional undergraduate classes can be delivered on the Web. As a supplement to my spring 1997 class in Environmental Law, I developed a class Web page.

Technology Opportunities in CALS

Lecture notes, the syllabus, interesting links, and a discussion forum are among the items that can be found there. Take a look for yourself at <http://www2.ncsu.edu/ncsu/cals/course/are309/>.

To further these efforts the Provost's office established Project 25 (the Project 25 Web site is located at <http://courses.ncsu.edu/>) to support experimental online courses. With funding from Project 25, I created an online version of ARE 306, Agricultural Law. This course was offered for the fall 1997 semester. There are seven students currently enrolled. It is taught entirely online, except exams are still taken in the traditional manner. You can take a look at this course at <http://courses.ncsu.edu/ARE306/>; however, you can't look at the discussion forum. That is password protected to protect student identities and workproduct.

Both the students and I have discovered that an online course takes more time than a traditional course; however, there is a major advantage for students. Students can take control of their schedules. Most of the students enrolled in

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http://www2.ncsu.edu/ncsu/cals/ag_rec/virtual_library.html*

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the online section had scheduling conflicts, either with other courses or with jobs. This course provided them with an acceptable solution.

The online version of ARE 306 is an experiment; all of the students are on-campus. However, much that I have learned developing the course can be applied in my Extension education program. This technology provides a great way to provide classes and training to those who cannot come to campus. These technologies, by allowing us to reach those who cannot come to campus, bring us full circle, back to the original reason that extension programs were created almost a century ago to reach those who could not come to the learning centers.

Additional Resources

World Wide Web Development Resources

www.cals.ncsu.edu/ncsu/cals/computing

CALS Courses With Online Material

www2.ncsu.edu/ncsu/cals/academic/courses.html

NC State University Project 25 Courses

courses.ncsu.edu

Technology for Teaching Faculty

Training services, instructional technology, desktop applications, web development, multimedia classroom training

www.cals.ncsu.edu/computing/

Tools for Teachers: Course and Web Page Generators

www2.ncsu.edu/ncsu/cc/pub/teachtools/menu.html

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