Extension education has been delivered through a large number of different media during the past 100 years. In 1902 Perry Holden criss-crossed the state of Iowa in a railroad car holding classes on modern corn production at each stop. This early “corn train” was just one example of using technology to bring information to the people. Later, Extension agents drove automobiles through mud and snow to make farm visits and educational presentations. Such trips were effective, but time consuming and costly. University specialists also made use of commercial and public radio as early as the 1930s to bring market information and education to farm families within broadcast range. In the 1950s television allowed Extension clientele to see as well as hear messages. Satellite communications technology in the 1980s was combined with television receivers and dishes to carry educational programs to county extension offices and private homes. In some states fiber optics networks have been used to deliver face-to-face education electronically. In the 1990s the Internet and electronic mail arrived on the scene, and interconnected the world to a degree never imagined even a decade before.
Internet Delivery

According to a 2003 National Agricultural Statistics Service survey, 48 percent of U.S. farmers and 51 percent of Iowa farmers have access to the Internet (NASS). Advances in both software and hardware have made it possible for even the most minimally trained person to send and receive unheard of volumes of information in just seconds.

Extension educators were quick to discover the power of posting information on World Wide Web pages, where thousands of people per day can see and record it. However, simply posting information does not guarantee that it can help people solve real world problems. Land Grant System educators have always insisted that the principles of applied science must be learned before current information can be used to make decisions. Can the powers of the Internet be used to accomplish this? Extension economists at Iowa State University decided to test this theory by offering electronically delivered home study courses.

Getting Started

The first course, Advanced Grain Marketing (AGM), was developed over the summer and fall of 2001, and launched in January 2002. About the same time, the North Central Risk Management Education Center, located on the University of Nebraska-Lincoln campus, issued a request for proposals to test innovative delivery of risk management related education. A full proposal to establish a project called the Agricultural Management e-School (AMES) was submitted and funded.

The mission statement chosen for AMES was as follows: “The mission of the
Agricultural Management e-School (AMES) is to extend management education to
agricultural producers, educators and service providers. AMES complements traditional meetings, bulletins and newsletters. In-depth self-study courses and resource centers that address important management topics are available at any time and any place that an Internet connection exists.”

The following AMES courses have been offered or are in various stages of development:

• Advanced Grain Marketing Began January 2002
• Financial Decision Making Began January 2002
• Farmland Ownership Began June 2002
• Farm Leasing Agreements Began July 2003
• Farm Machinery Economics Under development
• Strategic Planning Under development
• Swine Marketing Under development
• Human Resource Management Under development

Each course is divided into a series of instructional modules. The number of modules per course ranges from 5 to 12. The following instructional elements were proposed for each module:

• Title
• Authors and reviewers
• Overview and outline
• Content
• Summary of key points
• Review questions and answers
• Exercises and case studies
• Completed examples
• Related software
• References for further study
• Related websites and links
• Glossary of key terms
• Chat sessions and threaded discussions with course developers

Not all the modules developed so far contain all of these elements, but this is a pattern to strive toward.

**Delivery**

The platform chosen for delivering AMES courses was WebCT®, a course delivery software package that is in use at many universities. WebCT is specifically designed for Internet delivery of instructional materials, and is well supported at Iowa State University. AMES courses have been able to utilize many of the capabilities of WebCT. Until the advent of AMES, however, it had been used only for formal credit courses, not for non-credit courses. The WebCT support staff have been very cooperative with Extension specialists in making modifications to fit nonformal course delivery needs.

Students request enrollment in a course by completing a form at the AMES portal website, e-mailing it to the AMES manager, and submitting the $100 registration fee. In return they receive a unique identification and password that allows them to access the
course at any time. A class list is generated that can be used for organizing threaded discussions and chat sessions, obtaining post-course evaluations, and communicating information about future courses.

Pages of content are wrapped in very simple html coding to provide a consistent format. Each module contains 10 to 20 html files, which the student can access through a table of contents. Although the files and modules are designed to be studied in order, the student can enter and leave the course at any point.

Quizzes are created by using either a WebCT function or a separate software package called Respondus©. The quizzes are placed at the end of content modules so that students can immediately test their comprehension of the material. They are instantly graded (electronically), and feedback provided for each question. Numerous case studies and example problems are offered, as well, with sample solutions.

It should be emphasized that students do not receive college credit for the AMES courses, nor are they graded on their progress. All the elements necessary for learning are provided, but the student can choose how many to take advantage of.

**Course Development**

From the beginning a team approach was used to develop each course. Separate modules were assigned to a group of Extension specialists. This approach broadened the experience on which to draw, and reduced the workload for each individual. However, it
also increased the coordination function, and resulted in some inconsistency in style and format initially. Some specialists served as reviewers of materials rather than primary authors.

In many cases existing materials were used as a starting point. For example, a home study course on farm leasing agreements has been used by Extension field staff several times over the past two decades. It utilizes text based lessons and newsletters. These lessons were converted to electronic file format, examples and review questions were added, and decision aid spreadsheets and live links were embedded in the text.

**Resources**

The most valuable resource for developing AMES courses has been the various Extension specialists who have contributed time as either authors or reviewers. Their expertise and experience have been essential to developing a quality product. Financial resources have come from the initial grant and funds generated from registration fees.

The cooperation of the Instructional Technology Center staff at Iowa State University, who support WebCT, has already been mentioned. Their assistance was at no cost to the project. Staff from the Extension Continuing Education and Communication Services have been contracted to carry out marketing activities for AMES. Their services are billed directly to the project. One part-time administrative assistant has been carrying out much of the file handling and editing duties, as well as handling registration and billing.
Marketing

Creating course material and a web site does not guarantee that users will find it or register for the courses. A coordinated marketing campaign was designed to promote widespread awareness of the AMES courses. The following strategies have been used:

- Publication of a general brochure describing AMES, for limited distribution.
- Publication of individual cards for each course as it came on line.
- Publication of bookmarks with basic information about AMES, for wide distribution.
- Radio interviews on a daily program that is carried by 65 stations across Iowa and neighboring states, and Promotional articles in the farm press.
- Creation of stand alone displays that can be set up at meetings and conferences.
- A blast e-mail to the Iowa Chapter of the American Society of Farm Managers and Rural Appraisers mailing list
- Booths at 2002 Farm Progress Show and other trade shows.
- Classified ads in national farm media such as Successful Farming and Agriculture Online.
- A Google “AdWords” campaign.

A dedicated AMES web page was developed to serve as a portal to all the AMES courses. It can be viewed at: www.extension.iastate.edu/ames. Besides the mission statement and contact information, the AMES portal contains a one-screen description of each course, an on-line registration form for each course, and a direct link to the WebCT
login site. This allows all questions about course content and enrollment to be directed to a single web site.

**Participation and Evaluation**

Total participation in the AMES course to date is 338 students. The Advanced Grain Marketing course has attracted 253 enrollees over two full years. The other three courses have attracted fewer participants, but have been available for only a year or less.

A detailed evaluation instrument was designed and mailed to all 124 people who registered for the Advanced Grain Marketing course in the first year. Twenty-five percent of them replied. Following are some of the major points that were gleaned from the results.

- Each of the ten modules of the course was ranked with respect to the usefulness of the information contained in it and the clarity of communication. The average score for all modules was 2.81 on a 3-point scale for both content and clarity, indicating a high degree of satisfaction on both counts.
- 93.5 percent of the respondents said the length of the modules was about right.
- 68 percent read all ten modules completely through, and 89 percent read more than half the modules completely through. The same percentage said they completed all the exercises.
- 41 percent said they encountered some technical problems accessing modules, quizzes or exercises. Most of the problems had to do with navigating within WebCT.
• 47 percent participated in at least one of the group chat sessions.

• 83 percent said they developed a grain marketing plan on paper after completing the course. This is probably the most significant indication of putting information from the course into practice.

• Print media was by far the most common way that respondents found out about the course (55 percent).

• 96 percent said they would recommend Advanced Grain Marketing to a peer.

• 80 percent said they thought the $100 registration fee was about right, while 16 percent thought it was too high.

The most common positive comment from participants about the course was the ability to learn at their own pace when time was available. Some respondents appreciated the instructor support, but others wanted more contact. Some found it inconvenient to print the course material for later reading.

**Challenges**

The Agricultural Management e-School was launched without hiring outside personnel. Using existing faculty and staff to develop the educational materials was a benefit in that the content and style was of high quality, and the first course was ready to pilot in a relatively short period of time. The disadvantage to this approach is that staff members have many other responsibilities and demands on their time. This was particularly evident after the 2002 Farm Security and Rural Investment Act was passed in May 2002. For nearly 10 months educational activities related to this legislation received first
priority, and development efforts for the AMES courses came to a standstill. Work was resumed in summer of 2003, but progress remains behind the original timetable.

A second challenge is to fully exploit the capabilities of the Internet and WebCT as educational media. Extension specialists are quite used to preparing written publications and presentations for live audiences, but electronic home study courses can incorporate many more features, as summarized earlier. The temptation was to take existing bulletins and simply convert them to electronic media. This is a good start; however, the real work comes in adding the review questions, links to references and data sources, glossary terms and definitions, examples and case studies, and other features that change a passive reading activity into an active learning experience. An aggressive review process has helped to encourage authors to utilize the full realm of tools available.

User fees for Extension activities are a fact of life today. The WebCT system allows the administrator to control access to the AMES courses, and to enforce a course registration fee. The $100 course fee is considerably lower than many commercial Internet delivered courses, but still high enough to ensure a serious commitment on the part of the registrants. The evaluation survey showed little resistance to the fee, but of course there was no way to identify or survey potential clients who decided not to register for a course because of the cost.

A final challenge was the capacity of our targeted audience to receive materials over the Internet. Although rural Internet service is improving rapidly, many people are still using
slow speed modems and telephone lines. In response, we elected not to use audio or video files in our course modules, due to the large file size and slow download time for many users. This somewhat limited the quality of our educational materials. In our most recent course we have elected to use a 40-minute video segment portraying a role-playing exercise of a family who has inherited a farm and must decide on a lease agreement and choose a new tenant. We recorded this file on a CD-ROM and mailed it to course participants, rather than expecting them to download it electronically. Similarly, files could be delivered on a DVD medium for home use.

Future Directions and Goals

The most immediate goal is to make at least two more courses available during the early months of 2004, with development work on the others to continue throughout the year. This would complete the original set of courses that was planned, but the door is always open for additional courses to be developed, contingent on the interest of clientele and developers.

The second goal is to improve the existing courses. A top undergraduate student was hired in the summer of 2003 to go through each of the existing courses with a fine-tooth comb. She checked for editorial mistakes, broken links, errors in decision aid spreadsheets and other items that could present problems for users. As a result a considerable number of minor revisions were made. An evaluation survey similar to the one carried out for the Advanced Grain Marketing course will be performed for the other existing courses, for the purpose of improving both content and delivery.
The final goal is to promote both new and existing courses more effectively, using a variety of marketing tools. Collaboration with private and public sector organizations needs to be improved. In 2003 an agreement was signed with the Iowa Farm Service Agency in which completion of the Financial Decision Making course by a borrower would fulfill the FSA borrower education requirements. This agreement has the potential to reach several hundred additional users. The Internet itself will be used more as a marketing channel. For example, a fee has been paid to a commercial search engine service, to have AMES citations appear near the top of the search list for certain key words.

**Summary and Conclusions**

Preliminary results from delivering agricultural management education over the Internet are encouraging. The most important advantage appears to be that students can access the course material at any time and any place they have Internet access, and progress at their own pace. A second major advantage is the ability to combine basic content, decision aid software, links to outside references and real-time data sources, and access to course instructors in a single package. Extension agricultural economists will be challenged to fully exploit the capabilities of the new media, as well as incorporate future innovations.

**Reference**