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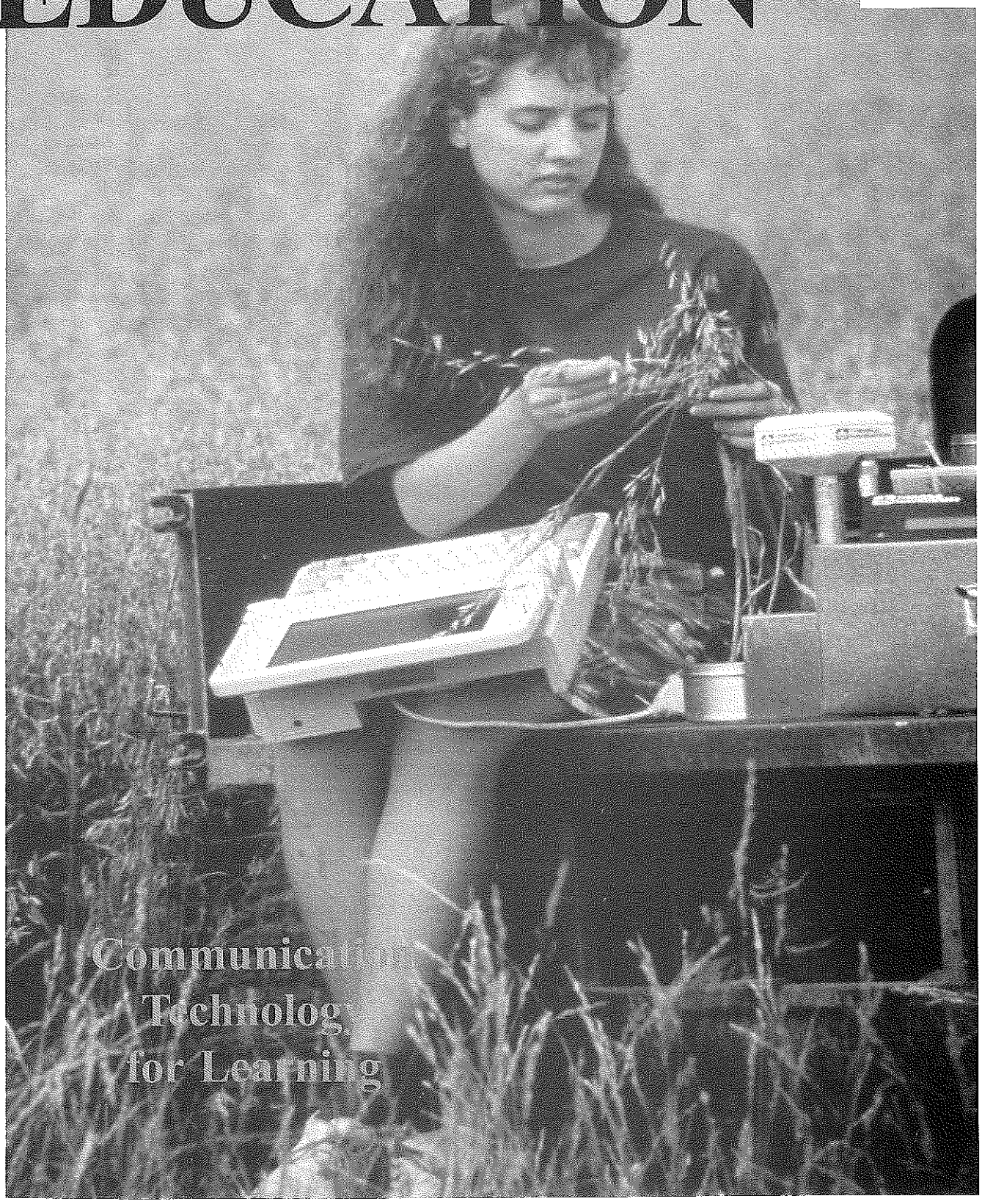


Communicating Technology for Learning

Introducing: A Focus on Learning

By Robert Martin, Editor

As the new editor of The Agricultural Education Magazine, I welcome the opportunity to produce a magazine focused on ideas, strategies and tools that work for the profession. It is also a real pleasure for me to introduce Stacie Turnbull. Stacie will be in charge of design and layout of each issue. Stacie is a former agriculture instructor from Nebraska. She is currently seeking a Masters of Science degree in Agricultural Education, at Iowa State University.

With this edition of The Agricultural Education Magazine, a new set of theme issues make their appearance. In trying to decide the 2001 theme for the magazine, it became clear that the "learning process" was an area that deserved some discussion. We need to share ideas, strategies and approaches to learning that are important to teachers of agricultural education at all levels.

You play an important role in this effort. You can be an active participant in the life of the magazine if you submit your article. We need to hear from a great variety of teachers in the agricultural education family. Be sure to check the publication schedule and let us know if we can be of help in publishing your article.

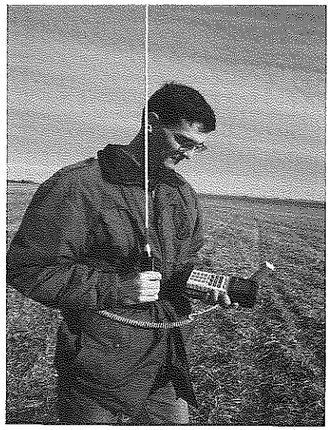
It has been exciting organizing this year's themes, reviewing articles and putting together the components of the magazine. It is my goal to help our readers gain as much from this publication as possible. I hope that the ideas, strategies and teaching and learning tools shared throughout the year are helpful to teachers and that in some small way the teaching and learning process is enhanced.

The first issue of the new year focuses on Communication Technology for Learning. Glen Shinn has acquired and organized an interesting group of articles for this issue.

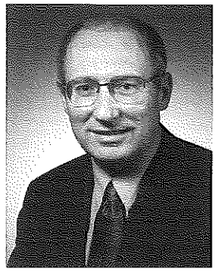
The response to the call for articles was overwhelming. Far more articles were submitted than can be used in one issue. A select few were chosen for inclusion in the first issue of the new year. However, it is my hope that all articles submitted with the technology theme can be published eventually. I hope future theme issues generate as much enthusiasm as this first issue.

Finally, I welcome your articles, pictures and ideas for improving the magazine. I challenge you to make a contribution to the profession by submitting an article to the magazine this year.

Welcome to 2001 and this new issue of The Agricultural Education Magazine. Enjoy!



Technology use in agriculture, such as Global Positioning Systems, are becoming increasingly commonplace. Photo courtesy of Iowa State University College of Agriculture.



Robert A. Martin is Editor of The Agricultural Education Magazine. He serves as Professor and Head of Agricultural Education and Studies at Iowa State University.

Theme: Communication Technology for Learning

Technology takes many forms and, as educators, it is our challenge to introduce it to students in order to prepare them for the future in agriculture. Photo courtesy Iowa State University College of Agriculture.

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Article Submission
Articles and photographs should be submitted to the editor, regional editors or theme editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed double-spaced, and include information about the author(s). One hard copy and one electronic copy of articles should be submitted. A recent photograph should accompany the article unless one is on file with the editor. Articles in the magazine may be reproduced without permission.

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Communicationg Technologies for Learning: New Tools and Proven Strategies

By Glen C. Shinn

Welcome to the new edition of The Agricultural Education Magazine. The authors have put forward consistent themes to foster learning: expect change, encourage active learning, build from proven principles, ask good questions, check for meaning, expect learner innovations, and expect change, and expect change!

There is little doubt that Internet technologies have an important role in learning and teaching for children and adults. Using http://google.com, you can search 1.3 billion unique URL's in a fraction of a second. This super search engine provides access to information that spans the globe. Experts calculate that "you can search the equivalent of a stack of paper more than 70 miles high in less than a half-second." Google located 14 million web pages with "learning" as a keyword in 0.12 seconds. A search for "agricultural education" located 560,000 web pages in 0.53 seconds. Amazing!

But information access must be coupled with accuracy. Learners must be able to assess critically the information they read, whether on the Internet or in traditional books. Teachers must become agile facilitators and use critical thinking and problem-solving skills when guiding learners toward sound solutions. The Miniature Guide to Critical Thinking (http://criticalthinking.org) identifies nine "universal standards" that include clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness. A pretty good checklist!

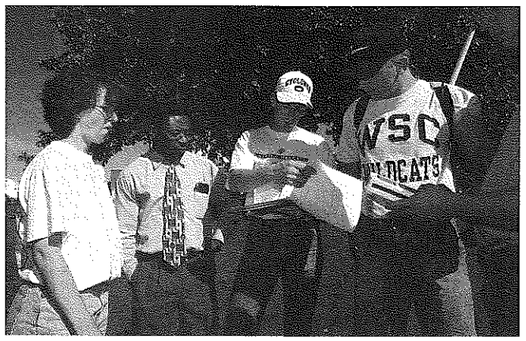
Proven strategies improve the learning by the student. Learners benefit from formulating clear personal goals, demonstrating persistent inquiry, reflecting on meaning, and using time management. Teachers are no longer gatekeepers to information, but must be able to help learners interpret data, check for biased sources, and draw conclusions from mixed findings. Cooperative learning is an effective strategy.

Free tools are available from "TrackStar" at http://trackstar.hprtec.org/. This on-line interface helps teachers organize and annotate Web sites into lessons. Additional resources are available at http://www.4teachers.org/, http://www.ansi.okstate.edu/, http://wise.berkeley.edu, and http://www-ims.tamu.edu/.

These new learning technologies can provide local programs access to original agricultural research, global perspectives, and even virtual field trips. If you are ready for spring, visit the Aggie Horticulture site and the wildflower collection at http://aggie-horticulture.tamu.edu/wildseed/wildflowers.html or join a streaming videoconference on Creating Digital Dividends in agriculture at http://www.digitaldividend.org/archives_18.html.

And if you are like me and sometimes find the technologies too complex, just ask a freshman with a MP3-CD player!

Glen Shinn is professor and head of the Department of Agricultural Education at Texas A&M University. You can contact him at g-shinn@tamu.edu or through http://aged.tamu.edu



Iowa State University agricultural education students are spending more time learning how to use technology in the classroom. Here students are seen using Global Positioning Systems technology. Photo courtesy Iowa State University College of Agriculture.

Glen's Bookmarks

http://google.com
http://criticalthinking.org
http://trackstar.hprtec.org/
http://www.4teachers.org/
http://www.ansi.okstate.edu/
http://wise.berkeley.edu
http://www-ims.tamu.edu/
http://aggie-horticulture.tamu.edu/wildseed/wildflowers.html

Technology: Providing a Borderless Classroom

By Robin L. Peiter and Alison Sexten

In the early 1900's, the foundation of agricultural education centered on teaching young boys production agricultural skills. The goal was to prepare students to go back to the farm. However, this foundation has evolved as a result of the expansion of agriculture and technology. Instead of farmers using horse drawn equipment to produce one crop on a few acres, today agriculturists can utilize technology to pinpoint specific quantities of fertilizer needed to produce the most off the land.

With this change, agricultural educators must be creative in exposing their students to this ever-changing technology by incorporating various forms into the curriculum. However, teachers must remember technology is a tool for the classroom, rather than a replacement for the instructor.

So how do teachers incorporate technology into the curriculum? According to a survey taken at the 73rd National FFA Convention, teachers listed computers as a major source of technology utilized in their agricultural education program. However, teachers should look beyond the use of a few applications when incorporating technology in their classroom instruction.

Distance Education is one form of technology being incorporated into agricultural education programs. It allows students to take advantage of colleges and universities across the nation.

At Scott County High School in Georgetown, Kentucky, students have the opportunity to gain college credit through an AP Animal Science course, administered by the College of Agriculture at the University of Kentucky. Students receive information through satellite and video instruction.

Teachers enhance the material presented throughout the course with hands-on activities. A benefit of distance education is that it exposes students to professors from many universities thus broadening their knowledge base.

With the agricultural education foundation, based on Dewey's philosophy of learning through experience, applying technology in and outside the classroom is a big factor in programs. Teachers can incorporate technologies used in industry.

Teachers must remember technology is a tool for the classroom, rather than a replacement for the instructor.

For example, LCD projectors, Global Positioning Systems, biotechnology processes, artificial insemination, CAD programs, greenhouses, water testing kits or microscopes may be used. Computers allow teachers to simulate situations related to the agricultural industry, with programs such as SimFarm, Feeder/Packer game, or the Breeding game.

Computers do play a large role in disseminating information in agricultural education. With the Internet permeating almost every school, teachers have the opportunity to utilize the World Wide Web to access information and as a tool for teaching.

In Sweet Springs, Missouri, agricultural teachers develop Internet scavenger hunts, which combines the current class curriculum with the World Wide Web. Additionally, teachers encourage students to research topics and present new information to their class.

Another example that incorporates the use of the Internet outside the classroom is through E-Learning. Teachers or web builders can establish an online course as another classroom tool.

For example, one company, Blackboard.com, developed a website, that allows teachers to post assignments and discussion questions to enhance class interaction. Also E-Learning opportunities encourage communication among teachers, students, parents, alumni and supporters of the agricultural education program.

Although not every school may have the financial resources available to build a greenhouse or a state of the art computer lab, teachers can utilize television, DTN, overheads, slide projectors, or scales to achieve the same goals.

Just remember creativity with technology is the key to a borderless classroom.

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No photo available.

Alison Sexten is a graduate research assistant in the Department of Agricultural Education, Communications and 4-H Youth Development at Oklahoma State University.

Reading, Researching, Writing, Reciting, Reviewing and Remembering": Revitied with Technology

By John Dillingham and Larry Ermis

To understand today, search yesterday.

As an impressionable group of student teachers listened in the 1970s to the late Thomas "Cotton" Neely, former teacher, coach, and advisor at Lubbock, Texas' Monterey High School, a question from the back of the room prompted an answer from Mr. Neely. "How do you continually motivate students to learn and excel in judging events, especially livestock and meat judging?" Cotton, as he was fondly called, responded without fanfare, "That's easy. Just use the six Rs: Have students *read* it, *research* it in the book, *write* it down, *recite* the answer, *review* the answer, and give them a test to find if they *remember* it."

Keep in mind, this answer was from a master agriculture teacher in an educational era devoid of computers, e-mail, digital cameras, or VCRs—where transparencies, 35 mm slide sets, mimeographed handouts, and chalkboards were the rule.

Less than fifteen years after that student teacher scenario, Naisbitt and Aburdene, in *Megatrends 2000*, forecast new directions for the 1990s based on global news reports. They aptly forecasted genetic manipulation of crops and farm animals, super tomatoes, genetically buttered popcorn, livestock with identical genotypes, animals for drug factories, and transgenesis. And they were right on target! What was not readily apparent was the impact of increasing technological demands on agri-science education and curriculum development. Naisbitt and Aburdene (1990) commented, "As we move through the next millennium, biotechnology will be as important as the computer" (p. 247). And, given the increase of computer usage in agricultural education since the publication of *Megatrends 2000*, the future will be even more interesting.

Current agri-science students and teachers are experiencing a technological resurrection of Cotton's philosophy in ways that would make the former teacher proud. The "six Rs" still hold true, but mix digital technology with rapid-fire agricultural advances, computer-savvy students, enthusiastic teachers, and "wired" schools, and watch out!

Technology has ushered in a change from traditional classroom lectures to teacher-facilitated and student-centered activities complete with Internet access, educational software, and sophisticated equipment. Rapid technological advances have enhanced applied agricultural activities, the historical mainstays of agricultural curriculum. Student learning has virtually "taken off" with increasing "megahertz and terabytes" for entry into an era of genomes, biotechnology, global information systems, and software applications.

Teachers Talk Technologically.

The following "agricultural megatrends" were shared electronically by teachers. Students and teachers' learning opportunities will morph in the 21st century as they read, write, research, recite, review, and remember while using the latest technology tools.

* At Sandra Day O' Connor High School, San Antonio, Texas, Holly Binns, agri-science teacher, indicated that Computer Applications in Agriculture is taught. O' Connor is an urban high school with 480 students enrolled in agri-science classes and 415 FFA members. Computers are used to complete projects for CDEs such as Agricultural Issues and Public Relations, Agri-science Fair research, SAEP record books, and research projects. Students also create presentations for laboratory safety, computer operations, and agricultural fair projects.

Technological applications in the field, provide students an opportunity to research what is learned in the classroom. Photo courtesy of Iowa State University College of Agriculture.

* Currently, Tony Dunkerley and Shane Crafton, Texas agri-science teachers at Henrietta High School have a 16-station computer lab plus a computer in each of two classrooms. Their computers are networked with the main school system to allow Internet access. Electronic presentations assist in presenting lessons, managing class time, and make sure all class sections get the same information. When teaching laboratory safety, presentations are shared so students obtain the same information when enrolled in different laboratory sections. All SAEP records are kept in electronic computer files. Students research various breeds of livestock by Internet and use CAD to sketch basic drawings in agricultural mechanics. FFA members produce highlight videos of chapter activities for entertainment and public relations at their annual banquet.

* Charles Jones and his students at Woodson High School, in Texas use computers to do research for local ranchers to determine types of supplemental feeds which are best for their beef cattle herds. Students measure the amount of forage in each pasture and gather sale receipts, weaning weights, calving percentages, and herd health information. Students collect data, input it, and determine the cost to maintain an animal unit. Students determine which supplement is doing the best job. Teacher, students, and ranchers have a supper meeting every six months. Students pair with the ranchers, analyze the data, and show the different costs of the various operations.

* Russell Graves, agri-science teacher from Childress, Texas, methodically integrates wildlife and environmental concerns into his classroom and laboratory. Quail, tornado, and black-tailed prairie dog research are examples of studies conducted by students in his Agricultural Resources class. Childress FFA members Emily Robertson and Jim Self were named champions in the 1999 National FFA Environmental Sciences-Team Division for their project, *The Effects of Black-Tailed Prairie Dogs on Plant Diversity and Soil Fertility in the Rolling Plains of Texas.* Students in the Agricultural Resources class use technology equipment to research wildlife and other natural phenomenon. Tools such as radio telemetry, GPS, surveying instruments, fiber optic endoscopes, remote viewing cameras, and the latest in computer technology are used for research. View the Childress High School Web site for innovative ideas for research and public relations.

"Just use the six Rs: Have students *read* it, *research* it in the book, *write* it down, *recite* the answer, *review* the answer, and give them a test to find if they *remember* it."

* According to Steve Atzenh, Texas agri-science teacher at Orange Grove High School students and teachers use technology daily. A video projector and laptop kept on a multimedia cart are used regularly. In Steve's opinion, fellow agriculture teacher John Jones of Fouke High School, Fouke, Arkansas hosts one of the best Web sites for presentations. Computers with web browsers are used daily for research projects.

* Ernie Eckert and Donnie Kiker, Texas agri-science teachers at Anson High School, utilize the CD-ROM *Interactive Workshop for Parliamentary Procedure*. The self-paced media is designed for review and feedback for a variety of parliamentary decisions. Instructional technology designer, Dr. Theresa Murphrey of Texas A&M University, developed the CD-ROM, mindful of student success, learning styles, interests, and attention spans.

* To ensure that student teachers are ahead of the learning curve, Texas A&M University's Dr. Julie Harlin, Agricultural Education, requires two electronic presentations of each prospective teacher. Student teachers are loaned a laptop computer to maintain communication with university supervisors, manage daily plans, and deliver electronic presentations.

* As software for data management and National FFA awards and degrees becomes commonplace, California and Texas groups are delivering SAE record keeping via the Web. To reach a national audience, Instructional Materials Service's new Web entry serves students and degree and award seekers in one "paperless" record book. Web-based, self-paced, and student-centered record keeping are megatrends not soon to depart.

With Technology, Work Smarter, Not Harder.

The list of agricultural megatrends is endless. Expect enterprising agri-science students and teachers to *read* and *research* using the Internet, *write* answers via electronic media, *recite* using digital media, and apply Web presentations for global *review*. Even Cotton Neely would have surely agreed that the *remembering* part of learning would be even more fun for both teachers and students!

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Naisbitt, J. and Aburdene, P. (1990). Megatrends 2000: Ten New Directions for the 1990s. New York: William Morrow and Company, Inc.

Wildlife Web - The Childress High School Ag Resources Class. (http://www.childressisd.net/wildlife/).

Woodson I.S.D. Exemplary District. (http://www.esc9.net/woodson).

Continued on page 9.

Technology Tools to Enhance the Classroom Environment

By Kathleen D. Kelsey and Jefferson D. Miller

Educational technology has been a part of our lives for quite some time. Some may remember the early versions of the teaching machines of the 1960s that held the promise of teaching children the basic skills necessary for success in school, while freeing the teacher to give more one-on-one attention to students.

As we learned back then, technology cannot replace the teacher in the classroom; however, it does provide the teacher with additional resources for enhancing classroom instruction.

When we surf the Internet, two things happen: first we are overwhelmed with the volume of information available, and second, we are amazed at the variety of information available. Like the three bowls of porridge that Goldilocks found in the bears' cabin, some of the information is of poor quality and overloaded with advertising; some is inappropriate to use with K-12 audiences, and some is just right, that is, high quality and content-appropriate for the classroom. It is in this roll that technology can enhance the classroom environment.

Learning comes about with repeated experiences and exposure to content; however, students prefer a diversity of media rich and visually stimulating content. They are no longer tolerant of the chalk-and-talk teacher of yesteryear. Rather, they are accustomed to multi-tasking as they go about their daily business (for example watching TV and doing their homework).

Teaching students to focus, through linear activities, is done best when each activity contains a different type of stimulation.

For example, a five minute lesson explaining root development, followed by a visual display of roots grown in a plexiglas container, followed by a simulation of root growth downloaded from the Internet.

It would be wonderful if teachers had the time to search the Internet for multi-media content to present on a daily basis, but they do not. This calls into play another technique for using technology in the classroom: teach the students to search for information and require them to present a 5-minute mini-lesson that complements the curriculum.

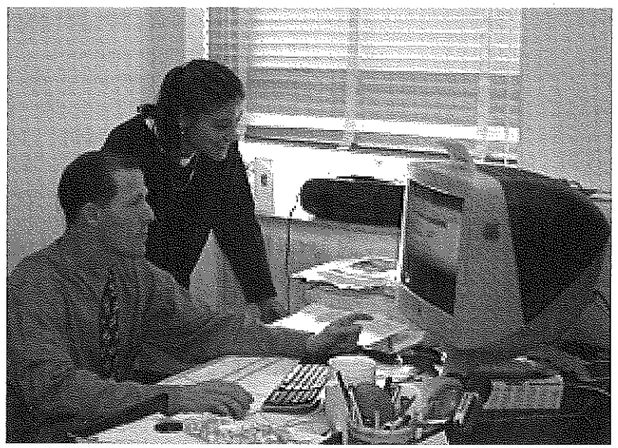
Each year the digital library resulting from this project will grow as students learn valuable searching skills that will be useful for other homework assignments. We have incorporated this strategy into our courses at Oklahoma State University.

Each semester, the students in one graduate level class put together a 10-minute presentation on one aspect of experimental validity. The presentations, which consist of PowerPoint files that incorporate links to resources on the Web, are posted to the course web site, where they serve to teach future students what is expected for that assignment.

A side benefit is that each year the presentations are better, as students strive to out-do each other. As in the story of the "three bears" problem described previously, students involved in such an activity need to begin their Web searches with some criteria in mind regarding credibility of information on the Web.

1. Only web sites created and maintained by reputable sources should be used as resources for this assignment. Literally, anyone with a computer and an Internet connection can publish an opinion on the web, and many do; some even present their opinions as fact. Students must be aware of the need to verify information they find on the web by identifying the source used to create the web site.

2. Information obtained from the Internet should be timely and should contain a date of origination. Some information may have been made available on the Web six or seven years ago but without a date may appear as though it is late-breaking news. The problem is that seven-year-old information, in many disciplines, is simply inaccurate because of advances in research and technology. Without a verifiable date of origination, the credibility of any information on the Web is called into question.



Jefferson Miller looks at an Internet site with a student. Kelsey and Miller warn that students must understand the need to verify information found on-line. Photo courtesy of J. Miller.

3. Verification of claims or assertions appearing on Web-sites is as important as verification of information from paper publications. Rarely is one source enough to support an argument of any type.

Students should be encouraged to find several credible electronic sources of information on their topic and refer to them all in their short presentation. The temptation to use information from only one source is great, especially if the source is a well-designed Web site with a variety of information on a specific topic, but students must recognize the pitfalls of taking the easy way out.

One prevailing benefit to using technology in the classroom is the cost factor. Once the initial investment of computers, scanners, and printers are made, the costs of gathering, manipulating, and presenting information is negligible.

For example, Mr. Roy Degler, a special education teacher at Morrison High School, Oklahoma, started a literary club. The traditional outlet of such a club would be a newsletter containing students' writings and creative works. In order to obtain high quality graphic reproduction, four-color printing is recommended at a cost of one dollar per page.

Mr. Degler taught his students to develop a Web page and has posted the students' work to the Internet, thus bypassing the printing phase, and disseminated the work to friends and parents using a dynamic multi-media technique.

Employing technology in the classroom has several benefits other than the obvious savings in budget and instructor's time. The students of today are the professionals of tomorrow, and the workplace of tomorrow undoubtedly will require an ability to share information through multi-media channels.

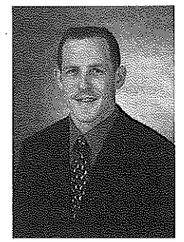
Exercises like the Web research project and the electronic publication allow students to begin building skills related to multi-media communications, including Web site and electronic presentation design. In addition to the technological skills, these projects introduce students to concepts related to visual design, logical argument, information organization, and written communication, all which are likely to become more concrete to students through practical application.

Using technology in the classroom should be viewed as an opportunity to enhance teaching, not as a replacement for the teacher. Students need high-quality instruction in mastering skills such as information seeking on the Internet and using computers and the accompanying software and hardware.

Once students are comfortable using technology, they can be given responsibility for co-creating the learning environment with original content that can be presented during the lesson. These presentations can be archived and used in subsequent years to continue to build a digital library of media-rich learning resources at little cost to the agricultural program.

Continued from page 7.

Kathleen D. Kelsey is an assistant professor in the Department of Agricultural Education, Communications, and 4-H Youth Development at Oklahoma State University.



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Fostering Active Learning Using Internet Communication

By Bret Hitchings and Joe G. Harper

"Riding the wave of the future!" is a phrase used in a recent series of television commercials about using the Internet to conduct business. Do you feel as though you are riding the Internet wave, or do you feel more like you are going to be drowned by a tsunami? We believe that the Internet is a "wave" of the future that is here and available now when it comes to delivering educational programs.

The Internet can be a valuable tool to enhance course instruction or allow for the delivery of distance education courses. However, as with any teaching tool, it must be used properly to be most effective. First and foremost, design of instructional activities must be based upon basic principles of effective teaching and learning as with any form of instruction. Additionally, teaching techniques utilized in traditional classroom settings need to be implemented in on-line settings. Applying principles of cooperative learning is one good example, because cooperative learning, by nature, calls on students to actively participate with a group to discuss an idea or complete a project.

Can the Internet provide an active, experiential learning environment? One of the first concerns that emerge from using the Internet to provide instructional programs is how to provide for active learning. Some contend that the Internet cannot allow for an active learning environment, however our recent experiences have shown that current Internet technology can be a great asset in fostering student-centered learning and actively involving learners. We will provide several examples of how to use various Internet technologies to deliver and support instructional activities that allow learners to take an active role in the class.

E-mail interaction

One basic premise that allows for successful implementation of active learning approaches is that the students feel a sense of community within the classroom. When students feel comfortable with the instructor and fellow classmates, they will be more likely to be active participants in class assignments and on-line class discussions.

In today's world, communicating via e-mail is just as easy, if not easier, than using the telephone. Teachers who use Internet technology for instruction should take advantage of this communication tool. Instructors should maintain contact with the students, and e-mail is probably the best way to achieve this. We found that sending weekly messages updating students on due dates, clarifying assignment expectations, easing concerns or frustrations students may have, and even mentioning non-class related messages regarding FFA or Ag Ed recent news helped to break down any barriers to communication that may exist.

Use of On-line chats

Another way to ensure that learners are actively engaged in lessons presented to them over the Internet is to allow for real time chats. On-line chats provide students with direct communication with fellow classmates and/or the course instructor. This can serve the same functions as communicating via e-mail (answer questions, clarify expectations, share ideas), but occurs immediately. There is no "lag" time between question and response. This also allows for more specific follow-up questions, which further enhance clarity.

On-line chats can also be implemented in a course to provide for cooperative activities for the students. Assigning students to teams and having them use a chat tool is a great way to facilitate cooperative learning over the Internet. One method we used was to assign students to teams, asking each team to discuss a particular topic by going to separate "team chat rooms". After allowing them to discuss, we have the group reconvene in the "main chat" and allow each team to share their idea with the whole group. This process can, and should, mimic how a similar cooperative learning exercise would be carried out in a "traditional" classroom setting.

When students feel comfortable with the instructor and fellow classmates, they will be more likely to be active participants in class assignments and on-line class discussions.

An added benefit of facilitating cooperative activities using on-line chats is that the instructor can monitor contributions of class members. The instructor can sit live within the chat room, just as a face-to-face instructor can sit with a group in a classroom. However, an instructor can view multiple "chat windows" for multiple teams simultaneously. Similarly, the teacher can have the team and group chats saved or archived so that he/she can go back and see who said what, who contributed greatly, who didn't actively participate, etc. While effective cooperative learning greatly lends itself to active participation of learners, individual accountability is consistently an area of concern for instructors. The issue of student accountability is minimized using online chats because instructors are able to, in a sense, be in more than one place at a time so they can monitor and evaluate student participation. However, more importantly, the learning is enhanced because the instructor will be able to work with more than one group at a time offering feedback, answering questions, and providing suggestions.

Virtual teams

Another way to accomplish active learning using the Internet as the primary teaching medium is to assign students to groups where they will work together as a "virtual team" throughout the semester. A primary benefit of this is that it gives students a stable, constant group with which to work throughout the duration of the class. Placing students in teams will call for them to work with the same people throughout the semester, allowing them to build comfortable working relationships with each other.

As students become familiar with and feel supported by each other, they begin to feel that way towards the class as a whole. They no longer have any feelings of isolation because they see that they are part of a group that is working collectively towards a common goal.

However, it is important not to isolate the teams from each other. When the class meets synchronously on-line (see the next section), the class members should be encouraged to work with others who are not on their teams. This will provide more venues for the students to become comfortable with each other, and the learning environment, which will in turn break down the any barriers keeping them from becoming active participants in class activities.

Real time interaction

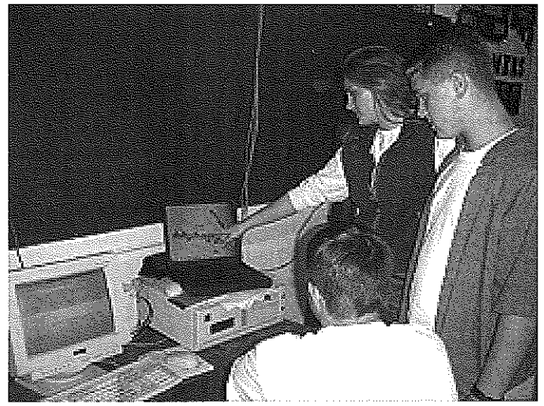
One component that is becoming more and more common in on-line courses is real time interaction between the instructor and the class as a whole. This is often referred to as "synchronous sessions" because the message is being sent and received at the same time by all parties. This differs from most other activities that are "asynchronous" in that the instructor might, for example, submit some information to a web page, and then the students will go receive this information at later, various times.

These synchronous interactions can take place in a number of ways including, text-based chats, telephone conferencing, or instructor broadcasting over the Internet to students where they interact with each other and the instructor in a text-based chat (the instructor communicates by voice, the students by written text). This final way is rapidly growing in popularity because of its effectiveness, and because a large number of people have adapted the technology necessary to make it available.

The extent to which they provide for class interaction makes these synchronous activities tremendously valuable, and almost necessary, for on-line courses, especially courses that are completely distance-based.

Catch the wave!

We have tried to provide several examples of how the Internet can provide an active learning environment. Whether you decide to use the Internet in your instructional program or take "on-line" classes yourself, look for strategies that foster active learning. We have found that Internet delivered classes and workshops can provide student-centered, active learning experiences quite successfully.



Hitchens and Harper encourage using the Internet to foster active learning. Glenn Shinn's students utilize both desktop and laptop computers. Photo courtesy of Glenn Shinn.

Photo not available.

Photo Not Available

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ASSESSING THE INFLUENCE OF COMMUNICATION TECHNOLOGY TO IMPROVE LEARNING

By Neil A. Knobloch

Effective educators focus their efforts on the learners and avoid the temptation of technology becoming the center-of-attention. A familiar cliché to agricultural educators, "the right tool for the right job," remains true for using technology in the teaching-learning process.

Just as builders begin creating blueprints before they can start using their construction tools and equipment, agricultural educators must purposefully develop a teaching plan, which starts with (a) identifying clear teaching goals and learning objectives and, (b) becoming familiar with the characteristics and backgrounds of the learners.

Next, teaching methods, learning activities, and instructional resources are selected based on alignment with the educational target (goals/objectives) and appropriateness for the learners. If educational technologies are the "right tools" to help all learners accomplish the learning objectives, then educators may continue their planning, implementation, and evaluation efforts.

Therefore, the purpose of this article is to share an assessment strategy that was used to determine how instructional methods, learning activities, educational resources, and communication technology influenced learning in a distance- and technology-situated environment. Furthermore, the most beneficial variables found to help learners in an introductory agricultural education course and recommendations for designing and implementing courses situated in a technology-based environment are discussed.

Communication technology influences the way we teach and learn (Clark & Salomon, 1986; Gutierrez, 2000). Educators need to assess the learners to determine how the technology has influenced their learning.

In 2000, an introductory course was taught to agricultural education students in a distance- and technology situated environment because a new, pre-agricultural education program was offered to students at a 2-year technical college 100 miles from Columbus, Ohio. Although the course was designed to be student-centered and aligned with the learning objectives, the instructor needed to know how the interactive video classroom and the web course management technologies were influencing the learners.

A two part assessment strategy was used to get feedback from the learners. First, the learners were asked four open-ended questions at mid-term:

(1) What has helped you as a learner in this course?

(2) What has hindered you as a learner in this course?

(3) What adjustments do you recommend be made to improve the teaching-learning process?

(4) Do you have any other comments you would like to share with the instructor?

The responses gave the instructor feedback to make necessary adjustments. Second, the responses from questions 1 and 2 were developed into a closed-ended questionnaire with 42 variables related to the interactive video classroom and web-enhanced instruction for students to evaluate the course at the end of the term.

The results of this assessment supported agricultural educators' need to select, design, plan, implement, and evaluate instructional technology based on the principles of teaching and learning (Knobloch, 2000). The learners benefited most from access to the instructors, cooperative learning, peer teaching, hands-on activities, and the instructor's interest approaches and summaries in the interactive video classroom.

Related to the web-enhanced instructional component of the course, the learners benefited most from convenience and flexibility to access course materials at anytime, instructor's class announcements and response time, and the course materials and a variety of resources including the interactive textbook. In addition, learners reported that submitting assignments electronically on the web was the only variable that hindered their learning in the course.

If educators prevent frustrations that learners may face in a technology-situated environment, it is likely that the technology will not affect achievement significantly (Russell, 1999). The difference in learning is a result of the methods of instruction and not the attributes of the media (Clark, 1994).

To accomplish this charge of sound pedagogy, The Institute for Higher Education (1999) recommended that educators design, implement, and evaluate web-based courses on some specific benchmarks (see diagram).

Agricultural educators who select, design, and integrate technology into their instruction to enhance clarity, make the content more comprehensible, extent students' thinking, monitor the understanding of students, and effectively use time and space (Dwyer, 1994), will see the difference among their learners by their successful performance of the learning objectives.

Hopefully, agricultural educators who create a blueprint for student-centered learning with clear goals and objectives will be able to successfully use the best technology to build learners who benefited from their masterful design.

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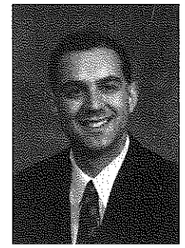

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The Institute for Higher Education (1999) recommended that educators design, implement, and evaluate web-based courses on the following benchmarks:

(1) Secure technical assistance and instructional support;
(2) Use a reliable, fail-safe technology delivery system;
(3) Select technology based on learning outcomes;
(4) Assess students' motivation, level of commitment, and technology skills and advise students before they commit to taking the course;
(5) Provide students with supplemental course information and sufficient resources;
(6) Make an agreement with students on assignment deadlines and instructor's response time;
(7) Provide students with hands-on training and information to use technology successfully;
(8) Provide students access to technical assistance;
(9) Answer students' questions accurately and quickly;
(10) Engage students to analyze, synthesize, and evaluate;
(11) Create interaction among students and with the instructor in a variety of ways;
(12) Give students constructive and timely feedback;
(13) Assess the teaching-learning process and evaluate the program's effectiveness using several methods and specific standards;
(14) Review instructional materials periodically; and,
(15) Review learning outcomes regularly to ensure clarity, utility, and appropriateness.

Using the Power of Technology to Enhance Online Learning Anytime, Anywhere, Anyhow: Are We Asking the Right Questions?

By Theresa Pesl Murphrey

In teaching workshops focused on how to create interactive online instruction. The most frequent question participants ask (before, during, or after the workshop) is "how long will it take to put my course online?" This question appears, on the surface, to be very straightforward, but in reality, it is not. Putting a course online is very similar to developing a course for the first time with the added dimension of selecting and utilizing technology—it varies from person to person.

As noted in 1966, "It is a common complaint among teachers that the main obstacle to the solution of the problems of education is lack of time (Sanders, 1966, p. xi)." This statement sounds very familiar in relation to putting a course online. What one fails to understand is that a course is not just "put" online, at least, not if the purpose is to use the power of technology to enhance learning.

Creating value-added online instruction involves a lot of work - as much, or more, then is needed to create a traditional course for the first time. Creating an effective online course, whether for high school, junior college, or university students, requires purposeful effort, attention to instructional design, an understanding of current technology, and access to development resources (i.e., time and money).

Instructional Design Precedes Technology

Rather than asking "how long will it take to put a course online," one should be asking, "how can technology be used to enhance learning?" To begin with, one must understand that technology should be used only when appropriate and only in a manner that will enhance learning. "It has always been too easy to become enamored with the technology side of technology-based training at the expense of proper design and learning outcomes" (Kruse, 2000).

Secondly, one must be clear about the fact that information is not instruction. The challenge that educators face is to transform information and traditional classes into value-added online instruction.

Developing a quality online course requires a team of four experts: a content specialist, an instructional designer, a graphic designer, and a programming/authoring specialist. Even if the project is a one-person job – the different perspectives (see diagram) should be considered and advice or services of those areas needed should be sought.

Four different perpectives combine for a quality online instruction perspective.

Instructional design remains the foundation of a quality course regardless of the delivery method. The basic question that needs to be asked is "What is the objective of the instruction?" I have found Bloom's taxonomy to be very useful in the "knowledge" level of Bloom's taxonomy. We can use Bloom's taxonomy to conceptualize activities that require higher levels of learning and thus lead the students into different kinds of thinking.

Gayne's nine-step approach (see diagram) to instructional design provides an effective method of ensuring quality online instruction.

The first step, to capture the attention of the students, can be accomplished with animation, sound, or a thought-provoking question. The second step, informing the students of the lesson objectives, is critical. Objectives should not be a mystery. Students should be made aware of what they are expected to learn — this will hopefully motivate them to complete the lesson. Next, stimulate recall by providing a frame of reference for the students to assist them in understanding "why" the lesson is important. Organize the material by topic and explain the material using a combination of text, audio, video, and graphics. Provide guidance for the students by using examples and diagrams to help them understand concepts. Elicit performance by providing self-graded quizzes to help the students judge whether or not they understand a topic. Provide informative feedback through explanations about "why" an answer is right or wrong. At the end of each lesson, have the students complete a comprehensive exam to measure performance. Finally, enhance retention and transfer by emphasizing how the new knowledge gained can be used and provide ways for the student to test their knowledge. Remember that the effort put into the process will determine the quality of the product.

Gayne's Instructional Design Approach

1. Gain attention
2. Inform learner of objectives
3. Stimulate recall
4. Present the material
5. Provide guidance
6. Elicit performance
7. Provide informative feedback
8. Assess performance
9. Enhance retention & transfer

Student Engagement and Interactivity Tools

Technology is creating wonderful educational tools for instructors to use in developing online courses that will enhance student learning.

First generation online courses consisted of a syllabus, course policies, assignments, lecture notes, and links to resources — basically information. Second and third generation online courses are interactive learning tools, not just informational sources. These courses include audio, video, graded quizzes, self-testing, animations, simulations, threaded discussions, and communication tools. As technology improves, these courses will advance to allow learners to control their learning environment. Instructors and course developers must be knowledgeable about available educational tools and strive to incorporate them into their instruction. The key is to use these tools to create value-added learning experiences by applying sound instructional design principles — not just keeping the student busy.

Examples in Progress

"Students learn best by doing, writing, discussing, or taking action, because active learning situations provide opportunities for students to test out what they have learned and how thoroughly they understand (Davis, 1993, p. 181)." To emphasize this point, I will describe two projects in progress that demonstrate the use of technology to enhance learning by actively involving the student.

Dr. Barry Boyd and I are constructing an educational simulation for a leadership class in which an ethical situation is presented for the student to solve. The simulation presents a specific scenario using text, audio, and graphics and then allows the students to make decisions as to what they would do in this situation. Their choice directs them along various paths; at the end of the simulation the students are presented information about leadership styles.

A second project I am working on with Dr. James Christiansen is focused on international agricultural development. Information about an international development dilemma is made available using audio and video interviews, pictures, diagrams, and documents.

The student is asked to review the information that has been made available and recommend a solution. The student receives feedback as to potential consequences of his/her recommendation and the solution that was actually implemented in real life.

These two examples demonstrate how technology is providing new ways to go beyond traditional instruction to enhance learning.

Technology is not the answer to all instructional dilemmas, but it is offering opportunities to help students learn that didn't exist before. The challenge for educators is to keep up with the potential of technology – and use it appropriately.

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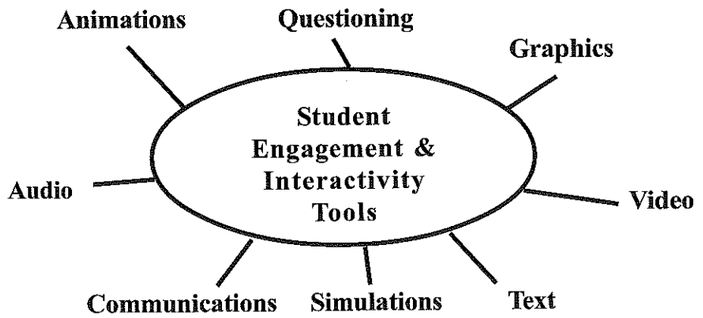

Murphrey shows the tools that technology provides to enhance student learning.

Educating for the Future

By Jenny Felt and Kristie Bray

"We must prepare learners for their future ...not for our past"
Dr. David Thornburg, Director, The Thornburg Center

The National Pork Producers Council (NPPC), which represents the nation's pork producers, was one of the first agriculture commodity organizations to stake out a presence on the Internet in the early 90's. Our web site and its content has evolved and grown rapidly. Clearly, with thousands of pork producers scattered across virtually every state in the nation, we realized early on that the Internet could become an efficient and effective way to reach our producers, not only with information but also with vital support in areas like research and education.

One of our most important jobs as an industry organization is to help our constituency, the nation's pork producers, manage risk and to help them adapt to change and remain competitive. Since the mid-90's we have used our internet site, the interactive capabilities of the DTN Ag News Service, and CD ROM's to reach thousands of pork producers and help them obtain the information and technology they need to operate in a rapidly changing world economy.

We have offered two distance learning classes through the NPPC web site, and over 350 pork producers have taken part. Up to five more classes are currently being developed. Computer based training in the areas of environment and Pork Quality Assurance are being explored. In addition, many of our on-scene conferences on various subjects are now available to producers on CD-ROM. That has expanded further our ability to reach thousands of producers who cannot be present in person at conferences and learning sessions held in various parts of the nation. We will be updating the capabilities of our web site early in 2001 to handle additional interactive programs.

However, we always keep in mind that we must not get carried away with the ability to deliver the latest state-of-the art changes possible. We must always keep in mind the audience that we are aiming these programs at, in our case pork producers. They do not all have the latest 'bells and whistles' computers. Many producers own computers that are unable to handle the latest technology. We must be careful not to offer state-of-the-art functions in our programs that will confuse and frustrate the very people we are trying to reach. We must be very careful not to let our technological capabilities get ahead of our producers' ability to receive and use the information effectively.

We discovered that it is not enough to merely transfer the contents of an existing brochure to the Internet site. Two different technologies are involved, and they must be handled differently and the content offered in such a way as to recognize those differences, or your efforts will likely fail.

We have not been afraid to adapt and change if something didn't appear to be working as we originally thought it might. There is nothing worse than leaving something online that has become out of date, or worse yet simply wrong. What seems right and will work well this year, may need revision of some kind next year, or outright replacement. Not only does technology change rapidly, so does the information itself and our prospective audience. In our case, the needs of today's pork producer are far different than that of the producer only five years ago. Your computer-based programs must recognize and reflect such things if the educational effort is to remain truly effective.

Our philosophy at NPPC is to use the Internet and other computer based technologies effectively, but not exclusively. It is just one new direction that education is taking. It has not, and likely never will, replace other forms of education, such as classroom, person-to-person, etc. If used effectively, computer-based technology can complement the long established forms of education, and can extend our reach to producers who have not previously been able to take advantage of the information and educational opportunities offered by our organization.

Even though the delivery system is different, any education program can only be effective if you first know your audience, and then develop and aim material specifically at that audience. One size does not fit all, even when working with the latest technology available.

Those of us involved in the producer education area at NPPC were fortunate in that our organization was an early user of the Internet technology. We were able to develop our ability to deliver information and make changes as the Internet capabilities developed and changed. We are still adapting to the changes and doing so carefully, always taking into account the ability of our audience to technically receive the information and then use it effectively. We must continue to do that in the years ahead if we are to remain effective. If the message isn't received by the intended audience and if it is difficult to absorb, then all of our work will have been in vain.

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Using the World Wide Web As A Delivery Method

By Chanda Elbert and Connie Baggett

As the U.S. demographics change from a predominantly agrarian society to one that is more urban, technology has shown tremendous advancement. This advanced technological progress occurred dramatically in higher education, including agricultural education, resulting in significant changes in the educational needs of today's students and teachers.

Teachers at institutions of higher education communicate differently as evidenced by the vast increase in the use of electronic mail systems and online teaching materials and activities. The impact of increased use of advanced computer technology on students' perceptions of their own levels of competence, however, remains unknown.

Through the use of the World Wide Web (WWW), professors may reach their students, both on and off campus, thereby appealing to a more diverse audience of students. Several studies have compared online education to traditional education.

Ward and Newlands (1998) stated that the WWW and its Internet links can aid in the learning process. Surprisingly, C.D. Baggett (personal communication, May 8,1999) found that over 1/2 of the students enrolled in a university introductory agriculture course had not received formal instruction in Internet use, electronic mail, presentation graphics, or computer programming. Nonetheless, there are many courses that can be designed to take advantage of the use of the WWW to enhance course curricula.

During the summer of 1999, we decided to implement several learning strategies in a microcomputer applications course. Strategic course planning and developing modules were used while transforming the course from a traditional to an online course. This involved creativity and was thought provoking.

During this transformation process, lectures, worksheets, assignments, quizzes, tests, and discussion materials were adapted for web delivery. For the traditional course, subject matter was delivered by lectures and demonstrations.

We wanted to compare the levels of learning attained by students enrolled in an online course to those in the traditional course. Throughout the development and implementation process, the overall scores in the online course were higher than those scores in the traditional course. This may have been attributed to the fact that students were able to complete assignments at their convenience as well as spending more time to complete assignments. However, students enrolled in the traditional course rated the course higher than students enrolled in the online education course.

The six "Ps" are "Proper Prior Preparation Prevents Poor Performance".

Personal interaction, which occurs in a traditional classroom, setting may have influenced student's perceptions of both the qualities of the course and the instructor. Also, student's decisions to take online courses, may be an important consideration for instructors designing or updating courses.

Technology is continuously changing, as is agricultural education. It is imperative that students in all fields of education continue to become skillful in technology usage. Although many students enjoy the convenience of instructional delivery in an online course, there are potential negative consequences. For example, an instructor cannot see a confused expression on a student's face when the student does not understand the content of the material covered.

Therefore, the instructor may not know or intervene when a student is having difficulty with course material. In such instances, the lack of interface between instructor and student may result in the student attaining lower grades or competence in certain aspects of the course.

Thus, the pros and cons of online education, e.g., increased access to resources, must be carefully weighed during the design of web-based courses. Instructors should strongly consider combining online materials with opportunities for direct feedback from students regarding the materials presented.

There are several ways direct feedback can be achieved. Most instructors have used electronic mail while others have used teleconferencing. Some of the more sophisticated software allows for "chat rooms." Yet, other software allows the instructor to extract student logon time, duration and online activity as well as to administer timed test completion. Nonetheless, our use of electronic mail for direct feedback left much to be desired.

From our limited experience, online instruction left us wanting for better planning, better hardware, better software, and better students. As we review the subject matter, we now know that the six "Ps" are paramount. The six "Ps" are "Proper Prior Preparation Prevents Poor

Continued on page 19.

The Superior Technology of Betamax

By Wayne Fanno

All you old timers remember Betamax. Sony Corporation's home video format. It was small, high quality, light, and produced by one of the leaders in the industry. And it was a failure. The technology was rejected by the general public in favor of the VHS format.

So you ask, "which one was better?" Answer, it doesn't really matter. In order for "consumer" technology to be useful a wide audience must use it. It must be considered a standard format or platform and hold some longevity. Betamax was not alone. The Apple IIgs, Amega, and NeXT computers are still being used, but I would not recommend anyone buying one.

Looking backwards is the easy part. What is on the market today that will be a good technology purchase for years to come? Good question. By looking at what is currently the standard, the platforms with flexibility, we should be able to see application with longevity for years to come.

With the coming of age of digital imaging, equipment is becoming more affordable and the technology is becoming standardized. Digital imaging is now a technology that can and should be used in most agriculture programs.

What is digital imaging? In simple terms, images are captured in the camera, and converted to series of 0's and 1's. Much in the same way that this text is converted from keystrokes into an electronic format that can be saved on a disk; images can be converted into ones and zeros. Digital imaging has several advantages over analog film.

First, the quality of the product does not degrade with successive generations. In other words, you can make copies of copies of copies, and the final "generation" is of the same quality as the original. Second, digital images are computer ready. No need to scan or convert. Once the image is saved, it's ready to use. Finally, the images are easy to reproduce.

To make a copy of an old photo, you will need to find the negative or scan the image. Both methods take effort. With digital, the image can be copied quickly and across multiple storage platforms. A picture could go from the camera, to a hard drive, to a CD, and finally to a 3 ½ disk within a matter of minutes. With the final copy just as high of quality as the original.

Three applications for digital imaging include; still photography, video, and microscopes. Again, this is not "new" technology, but it is technology that is becoming affordable, is flexible, and has achieved some standardized formats.

Digital Still Photography

Digital photograph cameras have made a broad impact in the digital market. The cameras are more expensive than similar quality 35mm SLR cameras, but the storage of images is relatively cheap as compared to film and photo processing.

Data (images) are most commonly stored in removable memory "sticks" or chips in the camera. The data is then downloaded using a cabling system that runs from the camera to the computer. Sony has developed a series of cameras that use a standard 3 ½" disks as the storage system, and has just released a camera that writes the stored photos directly to a writeable CD.

One of the most standard formats for the stored data is Joint Photographic Experts Group (JPEG or JPG) format. The cost for a quality camera will vary from $450 to $1,200.

The Sony MVC-FD90 sells for $900.00 and stores 10-30 images on 3 1/2" disks or memory sticks. Photo courtesy of Sony Electronics Inc.

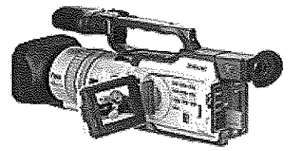
THE MVC-CD 1000 is the lastest in digital still images. Photos are stored on the camera's 156 MB - 3"CD drive. List price is $1,500.00. Photo courtesy of Sony Electronics Inc.

Digital Microscopes

With the increasing focus on the application of science concepts within agriculture programs, the cost of microscopes has been a real drain on program budgets. Yet to own a digital microscope from which time lapse images can be stored directly to a computer for later retrieval has been unthinkable.

Thanks to a toy maker, a digital microscope is now available at an affordable price. The Intel Play QX3 Computer Microscope looks like a toy, but acts like the real thing. With software to develop time lapse movies, up to 200x magnification, and multiple light settings, this toy proves to be a versatile tool for under $100.

One drawback of this low cost system is image quality. Images can be captured at a maximum resolution of 800x600. This is fine for most application, but some fine detail is lost.



Listing at $3,200.00, the DCR-VX2000 is Sony's top of the line Consumer Grade digital video camera. The Mini-DV format is flexible and the camera includes many extra features. A digital camera starts around $1,000.00. Photo courtesy of Sony Electronics Inc.

Digital Video

The latest digital format that is becoming available is digital video. Traditional video formats (analog, VHS) provide a quick and affordable method of recording movies. Their weakness is in editing and reproduction of a final product. As analog formats are copied, sound and video quality starts to drop. With digital, almost no quality is lost regardless of the number of times the data is copied.

Editing is done on a computer with via a IEEE-1394 connection (known as a "firewire" or iLink). Most editing systems require additional hardware/software and compatibility can be an issue.

Digital also offers a wide spectrum of recording formats. The most common are Digital 8 (Sony), mini-DV, DV, and DVCAM. Mini-DV, and DV are the most common formats currently. CD-ROM, Zip drives, hard drives, VHS, and DVD are all storage formats for raw and edited data.

One "wait to buy" is in recordable DVD systems. They are available but are expensive and currently several recording formats exist (do you remember our early conversation about Betamax vs. VHS?).

The major drawback on digital video is the price. A high quality, digital video camera will range from $1,000 to $4,000. An editing computer with software can range from $3,000 to $8,000 dollars. Add in a tripod, microphones, lights, camera case, batteries, and a few blank tapes, and we are starting to get into money that most agriculture programs do not have.

The good news? Like most computer technology, the prices are dropping quickly. Within a few years, digital video will be affordable. With endless application this technology is one that will find its way into the classroom soon.

With increased transfer rates on the Internet, faster home computers, and better monitors to view images, digital will quickly become a standard way to view and transfer images. Although the price of entering into the technology may seem high to some, it is never too early to explore your options, write grant proposals, and get familiar with the equipment. With a little research and good timing, you can avoid the digital version of the Betamax.

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Continued from page 17.

Performance."

Although little control can be administered over the hardware, we found that reliable hardware dramatically decrease student anxiety. Properly configured hardware is a must. Obviously, hardware must run with excellent and compatible software. Supplying subject material that the students' computer cannot access, download, process, or read causes much discomfort among the students. We found that good software and hardware, connected to a dedicated server work best.

Lastly, the quality of the enrolled student plays an important part in the teaching-learning environment. We had students of varying computer experience and subject matter knowledge. Students who felt more comfortable using the computer had a better experience with online instruction. We do not recommend online courses for technology-shy students.

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Agricultural Education: "Communication Technology in Use"

By Jacqui Lockaby, Cindy Akers, and Kalico Karr

Walk into an agricultural education classroom today and you will notice that it looks dramatically different than it did a decade ago. Of course the students' desks are still there, and there still may be the traditional chalkboard and overhead projector. But chances are they have been replaced with a white board and a computer projection unit. You will also see computer work stations in evidence. Yes, it seems that no matter how hard we have fought, the technology age has made its way into agricultural education.

Now please don't misunderstand, we are not making the assumption that agricultural education has had a great influx of funding to create these amazing class environments. But agricultural educators are creating the best learning environments they can to improve student learning.

It could be that the teacher has rigged up a video camera to project the computer monitor onto a larger television screen so the entire class can view a presentation. Replacing the traditional chalkboard with a white board may have been a project for the construction technology class. The important thing is progress in the technological realm of agricultural education is being made.

The classroom environment is not the only area of agricultural education where change can be seen. The students in the high school agri-science programs are not the traditional farm boys and girls that made up the population for many years. Today's student is from a non-production based, mostly urban setting. Often these students do not have a background in agriculture, but they do have an awareness and appreciation for it.

The traditional production agriculture curriculum has also seen a face lift for the new millennium. Current courses are being updated and new courses are being implemented.

One area of the program where curriculum, technology and this new breed of agriculture student meet is agricultural communications. A recent study of high school agricultural communications competencies conducted by Akers (2000) set out to identify what the student should learn in an agricultural communications course.

One of the eleven topics identified in this study was computer/information technology. Under this topic eight competencies were identified. These competencies range in difficulty from basic word processing to creating a web page.

Communications technology is a key component of many curriculums nation-wide. Ellis Clark Regional Agri-science and Technology Center at Nonnewaug High School in Woodbury, Conn., is wired for technology having 50 classroom computers with Internet access. Nonnewaug agri-science teachers incorporate technology in every class.

One of Nonnewaug's agri-science teachers, William Davenport, requires his agribusiness class to develop brochures, business cards and advertisements utilizing desktop publishing software. Davenport advocates technologies, believing the more computer experiences the students have, the better prepared they are for future learning.

Agricultural communications curriculums are being established in conjunction with the development of the national agricultural communications Career Development Event (CDE). The first agricultural communications CDE was held at the 2000 National FFA Convention. Teams from across the nation submitted and presented communications proposals and participated in a press conference after which they developed news articles, press releases, radio broadcasts and graphic designs.

John Jones, an agri-science teacher from Fouke, Ark. had a team compete in this contest. He said the contest ties into his current curriculum. "I think it ties in really well. If you taught in class everything that was in the contest, you would do a good job teaching agricultural communications," Jones said.

According to the national FFA, CDE's, formerly known as judging contests, were developed to serve as a compliment to regular classroom instruction. This is accomplished by allowing students to apply classroom skills in activities outside the classroom in competitive activities. Each of the CDE's help develop technical knowledge, reasoning skills and sportsmanship. CDE's are used to test skills and knowledge of individuals or teams in the major areas of agricultural instruction and leadership.

Technology is changing the FFA's Career Development Events Contests, from increasingly technical demonstrations to Power Point presentations. Such is the case with the Schuyler (Nebraska) FFA Chapter.

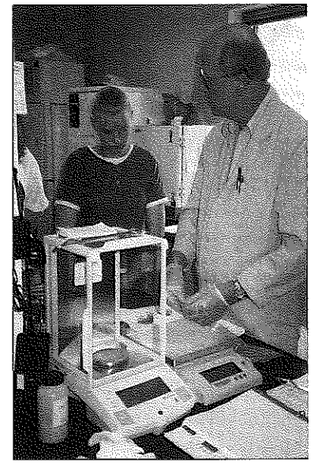
Communications technology is a large part of the agricultural communications CDE as well as classroom instruction. According to Jones a common misconception is that agricultural communications should only be taught in one course when in reality it should be a tool used in each discipline.

In Jones' wildlife management course, students are required to design a magazine advertisement using wildlife information they found on the web. Jones measures the success of utilizing communications technology in the classroom by observing the sense of accomplishment students get when comparing their creativity to each other.

Communications technology is not a new idea for Fouke FFA. The chapter has developed and designed their own Web-site to market their plants grown in their chapter greenhouse. Some of the components of the Web-site include availability, cost and growing requirements. Jones said he thinks the students learn not only from the process of developing a Web page, something not many were familiar with before, but also about marketing a product. "It's a basic web page; there are no bells or whistles," he said.

The Cotton Center, Texas, agri-science teacher, David Howell, finds many benefits in utilizing communications technology in the classroom. He believes that these tools assist in making his students life-long learners. Howell said, "As communications technology becomes more common in the classroom, one of the benefits I anticipate is improvement in ACT scores." The Cotton Center FFA chapter also competed in the National Agricultural Communications CDE.

The benefits of the agricultural communications CDE are numerous. "This kind of contest teaches life skills. Writing skills are something they'll use everyday," Howell said. "We think of computers as a new technology, but these students can't remember a time they didn't have computers," said Howell. "The way we implement them into our classroom to enhance learning is what will determine what kind a student we will produce from our programs in the future."



Funding is a major obstacle in introducing students to technology. Tom Wheeldon, instructor at Schuyler Central High School in Nebraska, utilizes industry resources, such as this water testing lab at the Excel Corporation.

Continued from page 16.

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Technology and Computers in Education

By Carrie A. Covington, and Thomas R. Dobbins

Paupathy (1992) defines education as the development in knowledge, skill, ability or character by teaching, training, study or experience. Computers and other technologies address these components, by increasing knowledge, using skills, and providing experience and training that will help them throughout their life.

In former President Clinton's State of the Union address, he stated that we must bring the power of the information age into all of our schools (1996). His statement indicates the importance of computers and technology in the classroom and society. As technology continues to advance, educators are going to be forced to keep and integrate this advancing technology into their classrooms.

Some benefits to teachers of using computers and technology are: they increase variety of classroom instruction, it is a great source of communication, a source of information and resources, are productive and motivational, and is an alternate teaching method to name a few.

Technology increases variety in the classroom by, allowing the teacher to break away from daily lectures and use tools such as PowerPoint to interest students. Computers are a great source of communication in which they allow teachers to communicate with other teachers and students by email or electronic bulletin boards.

Electronic bulletin boards are an excellent way for teachers to answer a student's question that may be too shy to ask in class. They also serve as a way to post assignments. The Internet in particular is a great source of information and resources. A teacher can research any topic on the web to gather information for a lesson.

Technology can be used as an alternate teaching method. One example is having students break into groups and do web searches for information on a particular subject then report to the class. Computers and technology also allow rural areas to be in contact with the global community. This introduces the teacher and students to the issues and problems that are influencing the world around us.

Computers also help teachers with organization and, according to Layfield and Scanlon (1998), have been proven to improve their general attitude towards teaching. A final benefit to teachers is that the Internet's information is available at all times.

Students also benefit from computers and technology. Several benefits are group collaboration, a place to exchange information, paced learning, access to world resources, and computer skills.

According to McLoughlin and Oliver (1998), group collaboration at computers encourages students to share ideas in ways that support cognitive and thinking processes. McLoughlin and Oliver (1998) also found that group work with computers increases problem solving capabilities and higher-order thinking, and development of writing skills and literary uses of language.

Electronic bulletin boards serve as a great way for students to exchange information ranging from text, graphics, or audio clips. These bulletin boards also can allow the students to communicate with their teacher after school hours. Internet courses allow students to pace their learning. All students learn at different levels and speeds, and the Internet can allow students to learn at their own pace. The Internet gives students access to investigate worldwide problems and issues.

Computers and the Internet provide students with an unlimited resource that is available at all times for curricula and classroom activities. Technology and computers teach students the most common applications such as, word processing, spreadsheets, and basic computer skills that "are important for all educated members of society to acquire." (Robertson, Calder, Fung, Jones, and O'Shea, 1997).

Students learn by doing, and using the Internet or computers to complete a class assignment is teaching them not only the class assignment but also computer skills that will be important for them to have to survive in society.

Students who leave school without knowledge of computers are likely to be at a disadvantage in the job market (Robertson, Calder, Fung, Jones, and O'Shea, 1997). Technology and computers can increase a student's motivation level. A student with a high motivation level has a high achievement level. Learning around computers is a social activity where learners share resources, talk, discuss ideas, and collaborate according to McLoughlin and Oliver (1998).

There are many factors that encourage or discourage the use of the Internet in Agricultural Education programs. In a study by Iverson and Peckham (1999) from the University of Georgia, it was concluded that, in Georgia, there is limited access and use of the Internet in the Agricultural Education programs surveyed. It was also found that the surveyed teachers had positive attitudes and were willing to learn to use the Internet. However, the teachers were concerned about using the Internet. They wanted to know if the resources available if the Internet was integrated into the program and they would like to excite students about their program through the Internet.

Though surveyed teachers felt comfortable with their skills, they believed that students knew more about the Internet than they did. The teachers would like to have opportunities to attend in-service on integrating the Internet into their program.

In a similar study completed by Layfield and Scanlon (1998), it is recommended that school administrators provide teachers with learning opportunities, and informational materials regarding use of the Internet and teachers should seek professional development activities on Internet application by attending professional meetings and other group activities supporting this medium.

Robertson, Calder, Fung, Jones, and O'Shea (1997) state that teachers need to feel that they have control of the technology and the pace of its introduction and that the amount and nature of the training teachers have will impact the effectiveness of the technology. Teachers need to be convinced that the time spent on learning to use technology is likely to yield benefits in terms of time-saving or improved student learning (Robertson, Calder, Fung, Jones, and O'Shea 1997).

In the Agricultural Education preservice teacher program at Clemson University, by way of a grant, the student teachers have been given the use of a laptop computer. The students are required to develop lesson plans by using Microsoft Word so they can share these lesson plans.

During their twelve-week teaching experience, they will use email to communicate their experiences with each other as well as the faculty. These computers are to be used to help them become better teachers by allowing them the opportunity to explore every avenue of their subject.

The use of technology will continue to be a major contributor to the educational process. However, we in preservice and in-service education must be able to provide courses, workshops and guidelines that will enable our teachers to benefit from the many positive aspects and not allow them to get caught in the few pit falls of technology.

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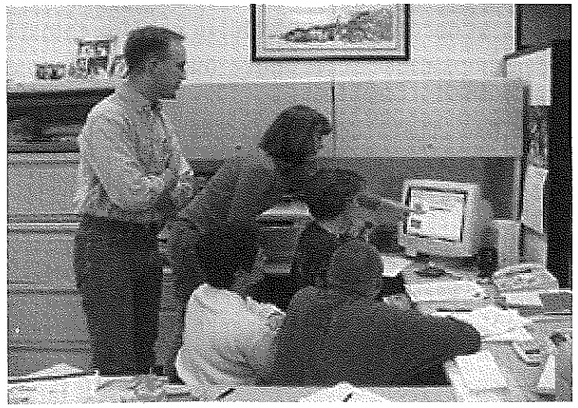

Covington and Dobbins stress the need for preservice and in-service education in order for teachers, and students, to benefit from technology. Photo courtesy of Covington and Dobbins.

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Telecommunications In Your Toolbox

By James H. Smith

It's interesting when we as educators get out of the box and introduce new methods of learning to our students. We find ourselves moving cautiously because "this isn't the traditional way" of learning. Learning can now be achieved in not only the traditional classroom, but also through telecommunications.

With the rapid growth of technology and the Internet, coursework offered through telecommunications is increasing worldwide. Many individuals question the differences between learning in traditional classrooms and via telecommunications, or "telelearning" (Tiffin & Rajasingham, 1995).

Allowing yourself to "step out of the box," provides an environment that allows your students to become better problem solvers, thinkers, collaborators, and, perhaps most importantly, teachers of each other.

Traditional Classrooms

In the 1800's and continuing on into the 1900's, established schools were housed in one-room school buildings. These schools usually consisted of nothing more than four walls, blackboard, chairs and tables. The physical presence of the instructor and students in one location was necessary, and students had to travel to an appointed location to meet together to learn.

Students were usually expected to stay in their assigned desks while the teacher stood in front of the class directing all instructional activities primarily through verbal presentations and using the chalkboard.

Much of our current educational system is based on this educational model, though a number of differences are found. Currently, traditional instruction is verbal and visual through the use of not only the chalkboard, but also the overhead projector, and television.

As part of this traditional model, students usually receive their assignments, if given one, near the end of the class period and are required to complete them out of class and be returned by a given date. This method of learning requires the student to retain information to be used at a later time.

Learning in traditional classrooms is centralized and hierarchical (Tiffin and Rajasingham,1995). The teacher is the center, the authority figure, and the knowledge giver of the classroom. As a result, students may have little control over their own learning within the teacher-directed classroom model. (Harasim, 1990).

Telelearning Characteristics

There are various telecommunication instructional delivery systems. They include educational broadcast television, instructional television, one-way and two-way audio, video conferencing, and computer-mediated communication. Instruction through the use of computer-mediated communication is becoming more and more popular.

The Internet and the World Wide Web allow learners and instructors to interact both synchronously (bound by time, but not by place) and asynchronously (not bound by time or place) and conduct "telelearning" (Tiffin & Rajasingham, 1995, p. 78).

Assignments can be done and turned in at the learner's convenience, and the World Wide Web itself consists of vast resources, which assist the learner's search of constantly updated information.

Learning via telecommunications provides opportunities for active student involvement. A major goal of collaborative learning is the participation of students in learning. In the controlled environment of the traditional classroom, the majority of student learning is limited to memorization of material delivered by the instructor whereas in collaborative learning, students learn how to discuss, research, investigate, and disseminate facts individually or in small groups with other students.

As a result, students have more ownership in their learning. Thus their learning shifts from a listener - competitor to a problem solver - team player.

The process of creating, analyzing, and evaluating in collaboration strengthens socialization skills, increases cultural awareness, and increases general interest, focus, and synthesis efforts (Ellsworth, 1997).

Electronic dissemination of collaborative projects provides students unlimited opportunities for sharing the results of their learning experience. The traditional classroom affords students the opportunity to share their work with their teacher and a few peers. As students communicate and collaborate through their learning activities, a forum for sharing their work is needed.

Electronic dissemination provides this opportunity. Students gain interaction with other students who have additional thoughts and comments to build upon foundational ideas developed in the collaboration process.

E-mail is one way of sharing student generated collaborative projects whether it is addressed to specific individuals or classes, or to a listserve for group dissemination. In addition, the World Wide Web provides an almost limitless audience for sharing collaborative projects over web pages, while enabling schools to develop learning communities.

On-line Learning Model

The computer is a tool, which offers learners the capability to complete multiple tasks such as searching, saving, revising, retrieving, and distributing information. The Internet allows enhancement of both teaching and learning.

Self-directed Learning

In contrast to traditional classroom learning, on-line learning encourages self-directed learning. Tiffin and Rajasingham (1995) see on-line learning as "decentralized", "democratic" and "learner-based" (p. 122). Students are given a measure of freedom to control the learning pace, sequence, and content. As a result of this freedom, learners must have responsibility for their own learning and discovery of knowledge. This self-directed learning component is reinforced as students recognize and value the breadth of information sources, search those sources, evaluate and choose sources, and retrieve information using all forms of media, technology, and telecommunications.

Critical Thinking and Cognitive Learning

The decentralized and flexible telecommunications environment provides opportunity for critical thinking and strengthens the learner's cognitive skills. Online conferences and discussions prompt learners to actively collect, handle, organize, and construct information. Learners are not acquiring knowledge passively through memorization or note taking because higher order thinking skills such as synthesis, analysis and evaluation are used in evaluating data to transform it into useful information and knowledge to solve problems.

Collaborative Learning

The concept of collaborative learning could very well be carried out in the online environment. Students are not only learning from their instructor but are also learning from students at other locations. Several skills are acquired through effective collaborative learning via telecommunication: problem solving, social skills, communication, various academic skills and acquiring information.

Active Learning

Harasim (1990) points out the reasons that on-line teaching would encourage active learning. First, collaborative work and research prompt active seeking and sharing of information and knowledge. Second, equitable participation ensures that each learner is highly necessary to group work, and active contributions of knowledge assist the progress of each member. Third, the asynchronous mode of on-line activity allows learners to input information at their own convenience and from an unspecified location; therefore, the frequency of interactivity increases. Shy learners were found to be interacting more frequently than in the face-to-face mode, according to a study by Montgomerie and Harapnuik (1997). They found that students became more open in discussions and reflected their thoughts in depth while in the online course. Last, active learning is also produced by the text-based nature of the Internet. Reading encourages learners to construct meaning of the information they are to share and to verbalize the information structurally, thus encouraging active learning.

Conclusion

Using telecommunications, teachers become facilitators and guides where student learning is more interactive and generative; learning is more focused on knowledge building; students are engaged in challenging tasks and have more control over their own learning. Allowing yourself to "step out of the box," provides an environment that allows your students to become better problem solvers, thinkers, collaborators, and, perhaps most importantly, teachers of each other.

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Ready or Not, Here it Comes!

By Cory Rosenbusch

It only seems like yesterday that I first set foot on a college campus and was floored by the concept of the Internet and e-mail. I remember thinking that the Internet was such an abstract idea and you one must be a genius or rocket scientist in order to use it effectively.

Some four years later, I will complete my undergraduate education, with my life revolving around the Internet, e-mail, and technology. As a student, I have discovered that technology is by no means a foe, but an essential component to my learning and training. I would like to share with you some of my experiences involving technology both in the classroom and outside the classroom.

I would have never dreamed that six of my college hours would have been totally earned via technology. During the summer of my senior year I decided to enroll in an Internet course. While apprehensive, I was excited about not having to attend class, since time was everything at that point in my life.

Before I was able to enroll, I had to take an assessment test to justify if my learning style would be complementary to this technological based course. No longer were the prerequisites 101, but Word Processing, Using HTML, attachment proficiency, and web navigation.

This particular course was a Psychology course, and I admit that it was one of my top three educational highlights while in college. I am a very independent learner, and I always have hated a traditional classroom setting. I would never listen to the lectures, believing that it would offer no value to my learning. Instead, I spent every class reading the text and learning on my own. My only wish would be that in the middle of my reading I could raise my hand and ask questions in regards to the topic.

That dream came true with the Internet course experience. Amazingly, I can say that through the Internet course, I had more interactions with my professor than any other instructor in my entire life. I would ask questions and engage in discussions two to three times a day with the instructor and students. These discussions were prompted by questions that she would post on a web-site that would spark dialogues among the students.

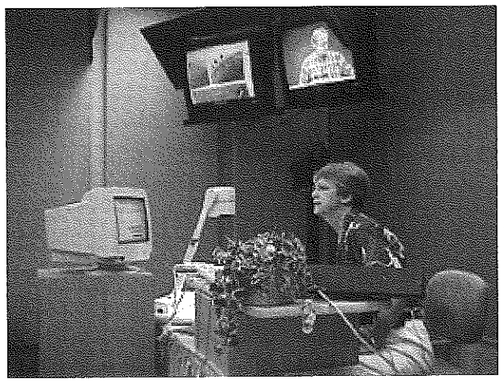
The purpose of these questions was not for us to regurgitate our reading, but a challenge to apply what we had learned. Our instructor was able to monitor our frequency of responses and participation, and then graded according to our participation.

The format was perfect for my learning style. We would be given weekly assignments via the Internet with readings and class notes that included deadlines to complete the work. Perhaps the biggest advantage were the notes that linked to Internet sites all over the world. This links would include streaming, videos, exercises, and illustrations. For example, there was an interactive program to teach us the components of the brain. By clicking on different regions, the part of the brain was highlighted and explained.

The greatest part was that these exercises were fun, interactive, and educational. These were exercises that solidified the material in my mind, and most importantly, they were exercises I would have never been able to experience if it weren't for the vision of technology introduced via the professor.

Perhaps the highlight of the class was the group project! A group project - over the Internet? That's correct, and we weren't allowed to meet in person or use the phone to work with the group. We would set chat times where we would meet in chat rooms, discuss our topics, responsibilities, and then go to work.

When our components were finished, they would be e-mailed to our team and comments were shared. Then the big day came for our class presentation, except we weren't literally in front of the class or even in front of the computer. We would build our own presentation using Internet technology and presentation designs. The days of class presentations using giant posterboards and markers are over, and in came the introduction of technology.



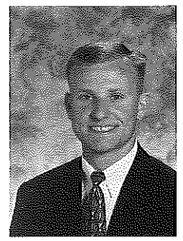
Non-traditional classrooms, such as Rosenbusch's internet class and this distance education classroom, are becoming more common in both secondary and post-secondary educational settings. Photo courtesy of Sandra Ann Flores.

What is most significant about this course and the final group project is its practicality of what we will experience in the "real world." As our society becomes more and more global, the amount of work we do via technology will continue to increase. We will have to participate in meetings via bulletin boards and discuss business via chat rooms. We will have to submit a proposal or deliver a presentation via the computer and Internet. And yes, we may never personally see the people we work with or for.

The application of the things I learned in that classroom is some of the most transferable skills I could ever imagine. While serving as a national FFA officer in 1996-97, I would talk to FFA members via online messaging, and coach them with their FFA chapter's problems or their own speeches. In my involvement on campus at Texas A&M University, I was directly involved in a 2,000 member organization that was intensively involved in training its new students on their new positions. Our job was creating a web based training program so that people could gain the knowledge, skills, and abilities without coordinating the schedule of 2,000 people. These are only a few example of where technology based classroom instruction would mirror our industries and future.

Such a great opportunity exists for teachers to embrace technology and integrate it in their instructions. The resources that are available via the World Wide Web are endless, if the time is invested to find the right material. The biggest challenge in my mind isn't learning the programs or process, but overcoming the fear of a new educational system. While it was frightening the first time I ever took a timed on-line test, I learned quickly the convenience and enhancement it brought to my thirst for knowledge!

It is true that on-line or technology is not for everyone, but hundreds of course now available via technology offer students the opportunity to select from several different styles that are used to teach the same subject. For example the University of Texas offers a "World Classroom" where students and teachers can find classes taught all over the world. They have been given the educational freedom to match they educational method with their learning style. I never met or saw my instructor last summer, never listened to hear lecture, but I didn't need to. I interacted and learned more from her than any previous professors combined. The students are ready, are you?



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"Times are changing" - are you up to the challenge?

Learning Takes Center Stage for 2001

With all the emphasis being placed on by various commissions, foundations, universities, and government agencies, perhaps the year 2001 should be declared the year for learning more about Learning. The 2001 theme for The Agricultural Education Magazine focuses on the question: What's new about learning? The six major topic areas capture the essence of our concerns about learning.

* *Communication Technology for Learning*
* *Evaluating Learning in and about Technical Agriculture*
* *New Dimensions for Experiential Learning*
* *Service Learning*
* *The Role of FFA in Learning How to Learn*
* *Lessons from the Classroom & Research on Learning Theory & Practice*

Please review the list of topics and key questions and develop an article for publication in The Magazine during 2001. The theme editors are eager to receive your contribution. We need your ideas, suggestions, and comments regarding practices and tools that work. As editor of The Agricultural Education Magazine, I hope that I can continue the fine work of previous editors. My goal is to help share the knowledge and skills developed and used by agricultural education professionals in a variety of settings. With your help The Agricultural Education Magazine will have a very successful year.

If you have questions or concerns, please contact the Editor, Robert A. Martin, 201 Curtiss Hall, Iowa State University, Ames, Iowa 50011. (Phone 515-294-5904 or e-mail drmartin@iastate.edu)

- Remaining 2001 Themes -

March/April – Due Date: February 25 (All copy must be to the editor, Robert Martin)

Evaluating Learning in Technical Agriculture: Teachers observe the results of learning and in this way learning is a lot like the wind. We see the result but not the actual thing. How do teachers evaluate learning? How do we document learning? How do we know learning has occurred? What evaluation tools work for teachers?

Theme Editor -Kathleen Kelsey: Dept. of Ag Education, 448 Agricultural Hall, Oklahoma State University, Stillwater, OK 74078-0484 (Phone 405-744-0461 – kelseyk@okstate.edu)

May/June – Due Date: April 1 (All copy must be to the editor, Robert Martin)

New Dimensions for Experiential Learning: What is the status of experiential learning in Agricultural Education? Has experience programs in agriculture kept pace with the changing clientele? Does supervised agricultural experience need revision; a new image? What are teachers doing to enhance and expand SAE?

Theme Editor - Lou Riesenberg: Dept. of Ag & Extension Education, 117 AEEB, 1134 West 6th St., University of Idaho, Moscow, ID 83844-2040 (Phone 208-885-6358 - lriesenb@uidaho.edu)

July/August – Due Date: June 1 (All copy must be to the editor, Robert Martin)

Service Learning: What is learning? Is service learning a passing fad or is it a tool worth using in agricultural education? How are agricultural educators using service learning in their programs? Does service learning make a difference?

Theme Editor -Cary Trexler: Dept. of Ag Education & Studies, 217 Curtiss Hall, Iowa State University, Ames, IA 70011 (Phone 515-294-0897 – trexler@iastate.edu)

September/October – Due Date: August 1 (All copy must be to the editor, Robert Martin)

The Role of FFA in Learning How to Learn: What role does FFA have in learning how to learn? Does FFA make a difference in helping students transfer learning to new situations? What do teachers do specifically with the FFA that help students learn skills that transfer into career development?

Theme Editor - David Doerfert: National FFA Organization, National FFA Center, 6060 FFA Drive, PO Box 68960, Indianapolis, IN 46268-0960 (317-802-4222 –ddoerfert@ffa.org)

November/December – Due Date: October 1 (All copy must be to the editor, Robert Martin)

Lessons from the Classroom & Research on Learning: Theory & Practice: How has research on learning affected the classroom? Has theory been translated into practice? Has our practice of teaching and learning been transformed? How do teachers experiment with different approaches to learning? What have teachers learned about learning as practiced in their classrooms, laboratories, and at job sites?

Theme Editor - Susie Whittington, The Ohio State University, Agricultural Education, 208 Agricultural Administration Building, 2120 Fyffe Road, Columbus, OH 43210-1067 (Phone 614-292-4624 – Whittington.1@osu.edu)