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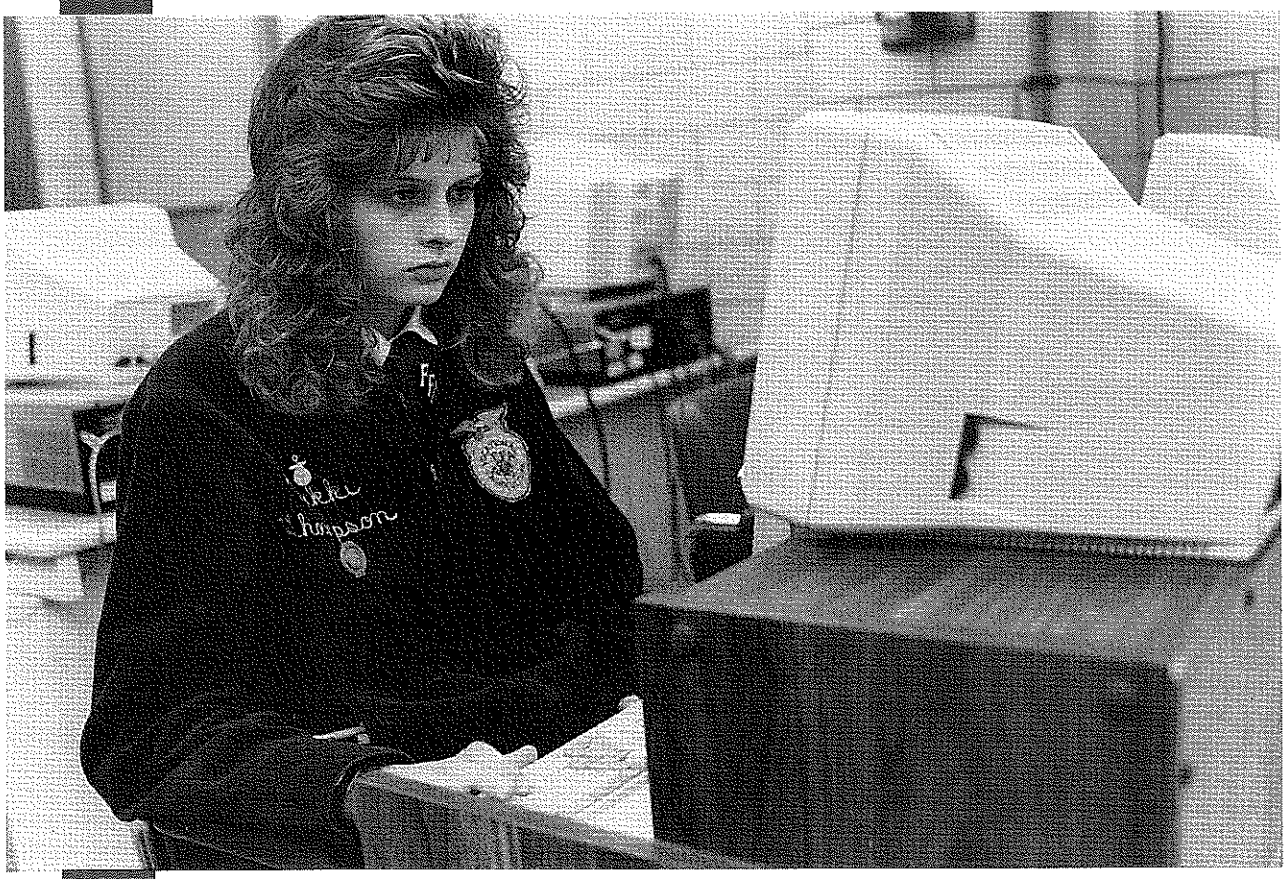

Instructional Technology

The Information Superhighway
The Internet
Interactive Video Networks

THE
AGRICULTURAL EDUCATION
MAGAZINE

August, 1994 Volume 67 Number 2

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ARTICLE SUBMISSION

Articles and photographs should be submitted to the Editor, Regional Editors, or Special 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). Two copies 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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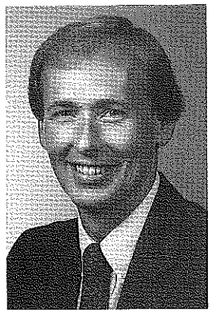
Making the Right Choices



BY ED OSBORNE
Dr. Osborne is associate professor and program chair of agricultural education at the University of Illinois at Urbana-Champaign.

Life is full of choices. And yes, teaching is full of choices—choices regarding which curriculum materials to use, what courses to offer, what FFA programs to emphasize, and what learning activities to use. Teachers also must decide which types of instructional technology they will use in their teaching. Overhead projectors, videotapes, CD ROM, computer technology, multimedia, satellite television—so many choices. Can you/should you try to use all the types of instructional technology that are available today? Perhaps not.

I currently serve as a faculty member on a doctoral committee in which the doctoral candidate developed a very nice hypertext computer program on the identification of woody plants. The program is authored in Toolbook and contains approximately 5,000 digitized color slides of key stages of growth and development for many different species of woody plants. The program has taken countless hours in development and looks extremely professional and appealing. Yet, in a preliminary test this spring, use of the computer program had no effect on students' grades in the course. Why not? Several theories arise, but one in particular seems plausible. In addition to the computer program, students had five other significant sources/resources, including the traditional lab discussions, to learn the material. Thus, in this case the use of the computer was not really advantageous from an achievement standpoint—students already had multiple sources of learning that were very effective.

This scenario raises some perplexing questions that can be directed toward instructional technology in general. "What are the outcomes/advantages of the technology?" "Does the technology have significant advantages over other approaches?" "What are the costs and benefits of the technology?" These are tough questions to answer. Perhaps in the above example, achievement was not boosted when using computers, but student interest and motivation may have been increased. If so, the cost of the technology may be well worth the investment.

The market is being constantly flooded with new technologies. Some of these clearly have the potential to make a positive difference in education, while others are long on flashiness and short on worthiness. Choosing instructional technologies based upon their actual or potential merit for enhancing education should be our primary decision point as educators. Several questions can guide our thinking as we try to assess the potential value of new instructional technologies:

1. Has the new instructional technology been found to increase student achievement, satisfaction, or motivation, or does it have the potential to do so?

2. Can the technology be effectively used with both individual students and groups of students?

3. How flexible is the technology in terms of the way and settings in which it can be effectively used?

4. Does the instructional technology fill an existing void in teaching methods or materials?

5. Can the cost of acquiring the technology be justified, in terms of its comparable educational effectiveness, affordability, or availability?

Lest I be judged as someone who snubs all new technology, I believe that oftentimes years pass by before the real educational value of some instructional technology becomes apparent. For example, in many ways, educators are still struggling with the most effective ways of using computers as instructional tools. We know that computers must offer real advantages as *instructional* tools, but the practicalities of implementing computer-based learning throughout the curriculum greatly limit the educational potential of this technological marvel. As with computers today, the merits of the instructional technology and the effective techniques for its use must sometimes evolve, or be discovered along the way.

Research in education suggests that the more teachers vary their media and methods, the more satisfied students will be with their learning and the more they will learn. This finding alone warrants continued development and exploration of new instructional technologies and their thoughtful implementation into our classrooms. Yet, we should avoid relatively large cash outlays for new instructional technologies without first being able to clearly identify their potential benefits and uses. And continued use and upgrading of any instructional technology should be based on evidence that its use makes a positive difference in some significant aspect of the educational process.

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Editor-Elect Named

DR. LOU RIESENBERG
University of Idaho Editor-Elect 1995.

At the 1993 Annual Meeting of the Editing-Managing Board of The Agricultural Education Magazine, Dr. Lou E. Riesenberg was appointed Editor-Elect for 1994. Following this one-year term, Dr. Riesenberg will assume a three-year term as Editor.

Dr. Riesenberg is currently Professor and Head of the Department of Agricultural and Extension Education in the College of Agriculture at the University of Idaho.

He has been at the University of Idaho, first in the Department of Agricultural Engineering and then in the Department of Agricultural and Extension Education, since August of 1979. He received his Bachelor of Science degree in Agricultural Education from Iowa State University in 1971. From there, he went to teach secondary and adult vocational horticulture in the Fridley, Minnesota, schools until 1976. During that time, he completed his Master of Arts degree in Agricultural Education at the University of Minnesota. In 1976, he began a term as a teaching associate with Dr. Forest Bear at the University of Minnesota, and in 1980, completed his Ph.D. in Education.

Dr. Riesenberg grew up on a farm in west central Iowa, but did not have the opportunity to participate in a secondary agriculture program or the related FFA activities. Between his high school graduation in 1962 and his matriculation to Iowa State University in 1968, Dr. Riesenberg worked for various agriculturally related businesses. The opportunity to be in the workforce directly out of high school has given him a unique perspective on the world of work.

Dr. Riesenberg has been awarded the Outstanding Service citation by the National Vocational Teachers Association; the Distinguished Service award by the Idaho Vocational Agriculture Teachers Association; the Administrator of the Year award by the Idaho Agriculture Teachers Association; and the Outstanding Faculty award by the Associated Students, University of Idaho. In addition, he has received the Idaho FFA Honorary State Farmer Degree, as well as the Honorary American FFA Degree.

Dr. Riesenberg is looking forward to accepting the editorship of *The Agricultural Education Magazine*. Dr. Riesenberg feels that the magazine should have value to **all** in the agricultural education profession. He is especially interested in hearing from those professionals who have ideas and suggestions on how to make the magazine more meaningful and pertinent.

Please feel free to contact him with any suggestions and/or concerns. His mailing address is:

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Note from the Editor

Attention Teachers . . .

Have you ever written an article for *The Agricultural Education Magazine*? The editorial team is constantly working to secure more manuscripts from teachers in the field. Currently, about 25% of all published articles are authored or co-authored by teachers. We would like to see that percentage climb closer to 50%, but we need your help! As I work just within my state I encounter many teachers who have stories that should be shared with other agriculture teachers around the country. These could be success stories, teaching tips, classroom or lab activities that work especially well, FFA programs — articles dealing with any aspect of the agriculture program. We also invite editorials and similar articles that present views for others to consider. Manuscripts should be approximately five, double-spaced, typewritten pages, which will convert to roughly two pages of printed copy. Remember, your audience is primarily other teachers, so write your article as you think it would appeal to your teaching colleagues. Several well composed black and white or color photos are always desirable. Be sure to include an author photo. Manuscripts may be sent at any time to the editor, or they may be sent to theme editors if they correspond to a particular theme. Themes are listed each year on the back of the July issue. Let us hear from you!

—Editor ■

It Boggles the Mind

BY KERRY S. ODELL,
THEME EDITOR
Dr. Odell is associate professor of agricultural education at West Virginia University, Morgantown.

Wow! Trying to synthesize and encapsulate just the recent advances in instructional technology is mind-boggling. Anyone who tries—and I emphasize the word tries—to keep abreast of information and communication technologies can tell you the challenge is monumental. The exponential nature of information generation has spawned a corresponding revolution in the packaging and distribution of information. Accessing information has become more important than creating it. The challenge for teachers is evaluating the information and incorporating technology into the instructional process.

Instructional technology has become an important tool for educating young people in today's global society. It has virtually eliminated the barriers of time and space. Worldwide networks now provide almost instantaneous information exchange between people, institutions, organizations and governments. The world truly is getting smaller and smaller every day.

Where Have We Been?

Filmstrip, slide and overhead projectors were some early forms of instructional technology used by teachers. They provided alternatives to the traditional lecture, but continued to place the student in a passive learning role. Not very long ago, educators touted the VCR as a revolutionary instructional tool. And shortly after that, microcomputers began to appear in schools and classrooms across the country and around the world. More recently satellites and satellite dishes have shattered boundaries and provided almost universal access to visual information. Nothing has been the same since. Technology has radically changed society—what we do and how we do it. Schools are no exception.

Where Are We?

We have come a long way in a very short time. Multimedia microcomputer systems, hypermedia, interactive video systems, satellite courses, statewide communication networks, and the Internet are commonplace in today's schools and universities. The question we now face is not whether technology has a place in teaching, but how to reconstruct teaching to take advantage of the unique opportunities technology affords. We must now find out how to use technology to better facilitate learning and begin to develop young people who can effectively interact in an information society.

Where Are We Going?

The mind of man is capable of anything—because everything is in it, all the past as well as all the future.

—Joseph Conrad

Many challenges remain. Communication and information technology is light years ahead of policy. The information superhighway will be dwarfed by a revolution in wireless communication where data, voice, and video will bounce around one of many global satellite systems. Teaching and learning will become a more individualized process. Teachers will become better facilitators of learning, more adept at accessing information, and less hesitant to adopt new instructional technology.

Schools will be different—more open, with greater access and use by the public, creating more opportunities for lifelong learning. There will be a greater emphasis on interagency cooperation and collaboration. Distance learning will be commonplace, and international understanding and communication will be firsthand, personal, and instantaneous.

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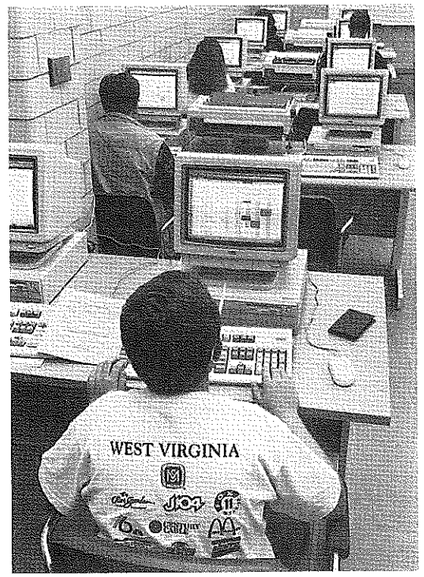


Students still need to "learn by doing." (Courtesy of Kerry Odell)

Merging Your Classroom Onto the Information Superhighway

BY TIM MURPHY
Mr. Murphy is a graduate fellow in the Department of Agricultural Education at Texas A&M University, College Station.

A year ago I was teaching agricultural science in rural Missouri, unaware of the resources available through a link to one of the national computer networks. I had heard other teachers talking about such resources and linkages at professional meetings, but I didn't really pay much attention. I really thought it was just another gadget. For some teachers with whom I have worked, the newest technological innovation that comes along is suddenly a "must have" item. They spend all their time learning to use some new educational technology, never quite reaching the point where it actually assists them in teaching, then abandon it for the next one. I believe that technology must follow and facilitate the curriculum; simply using technology must not be the goal. The technology must help educators and students reach goals. This article is about one technology that will.

This year, I've taken time to learn to use electronic networks, and I wish I had done it much sooner. This is a technology that will enable you and your students to reach goals. It will allow you to do better some things you're doing now, and it makes possible some things you simply cannot do now.

Why Go On-line?

Why should you put your department "on-line"? I've discovered three good reasons, and one reason which may not be good, but is important. First, you will gain access to almost unimaginable amounts of information. As agriculture teachers, we have always said that we want students to learn practical skills useful in the real world. Yet, too often, we attempt to do this through the use of textbooks and teaching aids which are convenient, but hopelessly outdated. Imagine using new curriculum materials, "not textbooks, but authentic information in its customary forms. Not what someone else thinks you should know, but what you choose to find out" (Lemke, 1993, p. 7). Currently you can have delivered literally thousands of files, from the latest USDA research to Bill Clinton's daily schedule, and the list of information available is growing so rapidly it takes a computer to keep up with it. These materials will be delivered to you instantly, and in many cases, free.

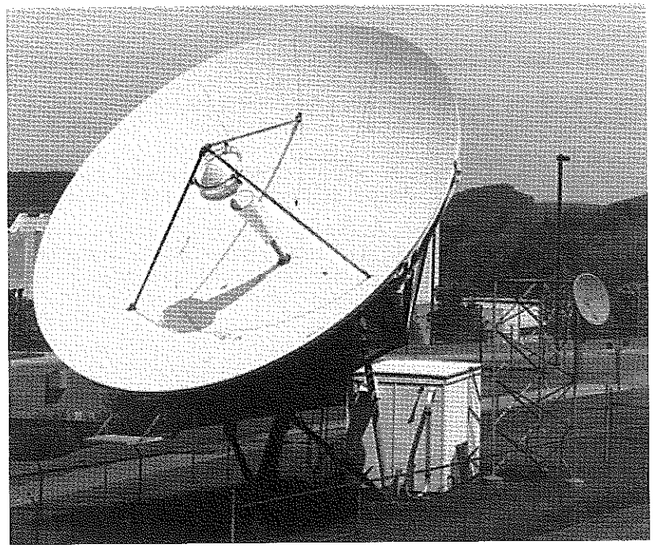
Secondly, you will be able to communicate efficiently, using text, graphics, and sound, with people who share your interests at distant locations. "Agricultural professionals will no longer be able to rely solely on bulletins, journals, and textbooks to solve problems. Rather, they will need to be able to draw from a larger resource pool, communicate with other specialists, share resources and transmit information" (Gunsett, 1993, p. 36). Electronic networks will help you accomplish all of these tasks, quickly and efficiently.

Thirdly, your students will love it. "The computer, in short, can become a tool students use to synthesize their own ideas" (Barrett, 1993, p. 52). "Today's students have already diverged...from the developmental track that formerly led to print literacy" (Lemke, 1993, p. 6). We can blame MTV and CNN, but the fact remains that students are becoming more visual in their learning styles, and they expect information relevant to their needs to be delivered instantly. This technology will provide both you and your students with that capability.

The important reason your department should be "on-line" is that this particular technology is here to stay. Electronic information, communications, and imaging technologies will change both how and what you teach in the next few years. People in President Clinton's administration, especially Vice President Gore, are absolutely committed to the idea of connecting every school in the country to what they've called the "Information Superhighway." In the same report, they say "access to the Internet and developing high-speed National Research and Educational Network (NREN) will be expanded to connect university campuses, community colleges, and K-12 schools to a high-speed communications network providing a broad range of information services" (Clinton and Gore, 1993, p. 35). They've committed three billion tax dollars to this project, and most experts agree that it is going to be a reality in the next few years.

Getting "On-line": Some Basic Choices

How do you put your department on-line? If your school has computer teachers, or media specialists, it would be prudent to check with them to see if your school might already be "on-line." Letting them show you the ropes, one-on-one, would be a great solution. If that doesn't work, and if you don't already own them, you will need to buy a computer, a modem, and some communications software. →



Satellite technology has provided many new instructional opportunities. (Courtesy of Kerry Odell)

That's the easy part. Then you will need to select a network. There are many choices.

If your computer has never been connected to anything outside your office, you had probably better "take the bus" out onto the information superhighway, which for most of us seems more like a toll road. There are more than a dozen commercial services currently competing for your business. Like city bus lines, these services cost money to use, and they don't always go exactly where you want to go, but they're safe and easy to use.

Let's take a look at four of these services: Prodigy, America Online, CompuServe, and Delphi. I'm no expert, and I am the first to admit that my experience is limited, but during this past year I've managed to draw some conclusions. Some services are easier to use than others, but right now there seems to be an inverse relationship between how easy they are to use, and what you are able to do once you're on-line with them. Some companies are working to correct this problem, making powerful network capabilities easy to use, but in the meantime you'll have to make some trade-offs. Because this type of service is so competitive, expect prices to change rapidly. When comparing cost between services, remember to check with each service to see if connecting requires a long distance call. Just call the numbers listed below and ask to see if you'll need to add those charges.

With over two million users, Prodigy, in my opinion, is the friendliest of them all. Based in White Plains, New York (1-800-PRODIGY), this service developed from a joint venture between IBM and Sears. Membership kits are available at most software stores for about $25. In March 1994, they were free from Prodigy for the cost of shipping and handling. The kits contain software that makes negotiating Prodigy a pleasure, and the first month you spend on Prodigy is free. Thereafter, users spend $14.95 a month for unlimited access to its basic features. You can read the headlines, get weather forecasts, play video games, and buy a variety of goods and services, including airline tickets at travel agent rates or fresh flowers to send to that significant other when you come home late again. Members can send 30 free electronic-mail messages a month to other Prodigy users. Each additional message costs 25 cents.

While it is the friendliest, Prodigy has some serious drawbacks. Users cannot communicate spontaneously with other members. Some other services allow this "real-time conferencing," and Prodigy is working toward it. The real problem with Prodigy, however, is the inability to download the files being browsed. Members can look, but in some cases can't have. This service might be a good avenue to initiate a new user to network communications, but it has limited usefulness for educators searching for curriculum materials.

America Online overcomes both these drawbacks. By calling the company's toll-free number in Vienna, Virginia (1-800-827-6364), members will receive a free copy of its dial-up software and five hours of free use. The software for Windows-based PCs is hailed as some of the best available, greatly easing the tasks required in network navigation. When the five free hours are up, however, America Online becomes about twice as expensive as Prodigy. Charges are $9.95 a month plus $3.50 for each hour spent on line. In an educational setting the hours could really add up. I would plan on using at least 20 hours per month.

Some people believe that it is money well spent. Using America Online, you can join discussion groups, download some 30,000 files, including free software, and use a window to send messages into the Internet, a network linking 15 million users in 50 countries.

If you're looking for a one-stop shop of on-line information, CompuServe could be the one for you. Owned by H&R Block and headquartered in Columbus, Ohio, CompuServe (1-800-848-8199) offers many more options than the others. Literally hundreds of forums (special interest discussion groups) are available, concerned mostly with computing and software. For those who play the stock market, or would like to, a wide selection of financial and stock brokering services is on-line, including Dun & Bradstreet's market identifiers and Value Line's company reports and projections. Over three dozen sections are devoted to hobbies and personal interests, including everything from AIDS to Scuba Diving. In addition, there is a →

large reference library with a news section that includes the Associated Press wire service and clippings from over 60 newspapers in the U.S. and dozens more overseas.

Two words of caution about CompuServe. First, this network caters mostly to the computer literate (read "geeks"), and so it is somewhat harder to use effectively than the others. This can be partially overcome by dialing up and typing GO CISSOFT to get a copy of the CompuServe Information Manager, a software package that makes moving around in this huge network somewhat easier.

Secondly, charges can add up in a hurry on CompuServe. The basic service is $8.95 a month for unlimited on-line time, with the first month being free for new members. However, this provides users with access to only 47 of the available services. To gain access to the rest can add $9.60 per hour for 9600 or 14.4 baud modems and above. On top of that, some users will add search and download fees, which CompuServe charges on behalf of the other on-line services that it carries. Searching for a file using the Dialog network via CompuServe will cost around $4 per search and $3 to download the document. CompuServe reminds users constantly of how much they've spent. So the bill won't be a shock unless the person paying the bill is not the one using the service, which could be a problem in a classroom setting.

Not as fancy or as friendly as either Prodigy or America Online, and not as large as CompuServe, Delphi is a better deal in many cases. Purchased in November 1993 by Rupert Murdoch's News Corporation and based in Cambridge, Massachusetts, Delphi (1-800-695-4005) offers a "20/20" plan, 20 hours of use per month for $20, with additional hours billed at $1.80 each. Where the others look more like video games, Delphi currently requires a little more patience to learn to use. The company has expressed plans to upgrade to a graphical user interface (GUI) during the second quarter of 1994, which should make the service much more friendly. To recommend it, Delphi has something none of the others offer. For an extra $3 a month, users can gain full access to Internet.

The Next Step

If you really want to adopt and use this technology, how should you go about it? In a recent study, researchers (Atherton, Harper, & Shinn, 1993) found that at least three factors will increase the likelihood of your successful adoption of this technology. First, plan for it. You are far more likely to adopt and implement a technology if you develop a plan, either written or oral, and share that plan with others. Then identify suppliers of the equipment you will need. Develop a relationship with these suppliers. They can offer technical expertise and assistance that you will desperately need as you begin using the technology. Being able to identify an average of three suppliers greatly increases your odds of successfully adopting. Finally, seek training in this area. The best training available is as near as your computer. It may sound like a "catch 22," but the best information on how to use the networks is on the networks, and we all know that the best way to learn is by doing, so just go to it.

Eventually, I think you are going to want to get off the bus, to move away from using one of the slick and easy commercial services, and hitch a ride on the "network of all networks," the Internet. Kathleen Fleck, in her article elsewhere in this issue, describes some of the services available on this network of networks.

For my teaching partner and me, summer was always the time to explore and implement new ideas. Throughout the school year we would keep a list of all the really neat ideas we'd seen all year. Then in the summer, when we weren't power-washing the lab walls or putting a new cover on the greenhouse, we'd buy the equipment and learn to use it before the students returned. This idea of connecting to a network and eventually getting on-line on the Internet is on my list for this summer; I hope you'll put it on yours. When you get on Internet, drop me a note at <thm5754@tamvm1.tamu.edu>. I'll be waiting to hear from you.

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Gunsett, Fields C. (1993). Enhanced Information Transfer. *Challenging the Past to Build the Future*—Conference Proceedings. Greensboro, North Carolina, March 21-24, pp. 35-43.

Lemke, J.L. (1993). Education, Cyberspace, and Change. *The Arachnet Electronic Journal on Virtual Culture.* March 22, Vol. 1 Issue 1. Available by sending e-mail to <LISTSERVE@KENTVM.KENT.EDU>. Leave the "subject" blank; in the body of the letter type, "Get Lemke V1N1" without any punctuation. ■

The World's Largest Computer Network: The Internet

BY KATHLEEN FLECK

Ms. Fleck is an undergraduate student in agricultural education at West Virginia University, Morgantown.

It's on the nightly news. It's talked about in schools and universities across the country and around the world. The Internet, a computer-based communications network, began about 20 years ago as a United States Defense Department project and has since expanded into a worldwide information system. Known as the network of all networks, the Internet is made up of various federal, regional, and campus networks, and a growing number of foreign networks as well. It allows people from just about any location to communicate with each other via the computer in "real time." Each user connected with the Internet system needs a computer address similar to that of a postal address. Instead of reading person, street, city, and zip code, the computer address reads user@somewhere.domain. If a message is simply being sent to a computer and not a specific user, the address would simply read somewhere.domain.

The boundaries of the Internet are limitless. A connection can be private, commercial or even international. Once connected, however, many opportunities and special tools are at the disposal of the user. Bulletin boards, electronic mail, and file transfer are just a few. But to take full advantage of the Internet, one must have a Transmission Control Protocol/Internet Protocol (TCP/IP) style connection. This type of connection is available through colleges and universities or from commercial services offering Internet access, such as those identified by Tim Murphy in his article, "Merging Your Classroom Onto the Information Superhighway."

Multimedia has become an important instuctional technology. (Courtesy of Kerry Odell)

The Internet is home to many cyber tools, each with a specific task assigned to them (e.g., finding people, software, or data). The Internet Gopher points users in the right direction by allowing them to browse available resources. By selecting a topic from the Gopher menu, one is commanding the system to retrieve any information on file regarding the specified topic. This allows the user to gather information without having to request a specific Internet address. WAIS (Wide Area Information Servers), another tool, is a way to search through indexed material to find information about articles based on their content. Another tool, the World Wide Web, is a hypertext-based system that helps the user access different resources. It is a super Gopher.

Since its development, the Internet has become a resource for teaching, research, and extension information concerning agriculture and the environmental sciences. There is an Internet connection containing information from the National Agricultural Library that includes five years of on-line information including references on nutrition, agricultural economics, and parasitology, as well as curriculum guides and other resources. Summaries from the USDA can also be obtained through the Internet system. These reports are updated bimonthly and contain agricultural and economic research. This resource can be reached through WAIS usda-rrdb.src.

PENN PAGES is an excellent service provided by The Pennsylvania State University. It contains information on all aspects of agriculture, family living and rural development. Access to PENN PAGES is gained by telneting to psupen.psu.edu. Many other colleges and universities have established agricultural and environmental databases and bulletin boards. Just a small sample of these is listed in the following table.

Name	Agency	Access Mode
CENET	Cornell University Extension	Telnet
CERF	Purdue University	Telnet
CUFAN	Clemson University	Telnet
QUERRI	Database of Extension Resources	Telnet →

CIESIN	Global Change Gopher	Gopher
EcoGopher	University of Virginia	Gopher
North Carolina Cooperative Extension Service Gopher		Gopher
Virginia Cooperative Extension Service Gopher		Gopher
Texas Agricultural Extension Service Gopher		Gopher

Water quality education materials are also available on the Net. One source of this information can be accessed via WAIS water-quality.src. The information at this site contains educational materials on water quality, watershed improvement and management.

If you do not know the name of the specific connection that you want to make, the Internet also provides the user with a billboard "list" of mailing addresses for news and discussion groups. This service can be accessed via WAIS lists.src.

The word "everything" might best describe the Internet. It is a reliable tool containing information on just that. . . everything. With developments in the agricultural and environmental sciences occurring every day, it is important for agriculture teachers, students, and other practitioners to have current information at their fingertips. The Internet is an easily accessible, user-friendly way to keep updated and informed. World demand for information has made the Internet an invaluable teaching, research, and extension aid.

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Making the Right . . .

(continued from page 3)

My point in all this is to simply suggest that before we invest in new instructional technologies, we need clear ideas as to (1) how that technology will be used to support our educational efforts and (2) why using that technology will be better than what we are currently doing. Just because a technology is available or everyone seems to have it is not enough. We must know how it will help us improve our teaching and follow an implementation strategy that allows the instructional technology to achieve its fullest potential for improving teaching and learning. ■

It Boggles the Mind

(continued from page 5)

What Must We Do?

Realizing the potential of information and communication technology for improving teaching and learning will require training and retraining teachers in the pedagogical applications of technology. A basic understanding of the technology is not sufficient. Teachers must use interactive instructional technologies to construct simulations, build models, solve problems, promote inquiry, and foster discovery. Teachers and teacher educators must meet the challenge of creating new and effective ways to stay current in both the knowledge and application of technology in education. Administrators and citizenry must plan for the changing nature of technology. Financial resources and the technical support necessary to keep the equipment in schools up-to-date and in proper working order must be available.

States need to continue the development of networks like those in Iowa and North Dakota. Promotion and enhancement of distance education should occur. Teachers need to be proactive in the acquisition and adoption of instructional technology. Colleges and universities need to provide in-service opportunities and educate prospective agriculture and natural resource professionals in the use of instructional and information technology.

"Learning to Do" and "Doing to Learn" are just as important with today's information technology as they have always been in agricultural education. Let's not forget that knowledge empowers people. Using instructional technology empowers the teacher and the student and provides for the development of skills that will be essential for life in a global information society. ■

Coming in September . . .

Theme: Experiential Learning

- The Experiential Learning Cycle
- Applications of Experiential Learning
- Experiential Learning in Teacher Preparation

The Information Highway in Iowa

BY W. WADE MILLER
Dr. Miller is professor of agricultural education at Iowa State University, Ames.

Education in the United States is rapidly changing. Newspapers and magazines carry numerous stories on how education is either succeeding or failing to serve the citizenry. The federal government and the states are responding to criticisms with new and innovative approaches to improve the quality of education. Vocational and technical education is a major part of this reform movement. Tech Prep, workplace readiness, integration of academics, and school-to-work transition are but a few of the new reforms being proposed and tested in the nation's schools. Delivery systems are also being examined and implemented. Telecommunications is considered to be one vehicle for delivering quality education.

In the 1980s, Senator Edward Kennedy made the following statement: "The economic battles of tomorrow are being fought in the classrooms of today, and the news from the front is not good." He made this statement in connection with proposed legislation creating the Star Schools Program. The legislation was passed and the Star Schools Program began in 1987. Its goal was "to encourage improved instruction in mathematics, science, foreign languages, literacy skills, and vocational education for underserved populations through the use of telecommunication networks. Several Star Schools projects have been funded across the country. Most of the projects have used communications satellites to deliver courses to large numbers of students located in dozens of cities and states.

On October 1, 1992, a Star Schools grant was awarded to Iowa to demonstrate a different type of distance education. Iowa's project is demonstrating a distance education system that uses a statewide, two-way, full motion, interactive, fiber optic telecommunications network. The Star Schools project is called Iowa Distance Education Alliance (IDEA). It uses Iowa's new fiber optic network known as Iowa Communications Network (ICN). The ICN first became operative in the fall of 1993. There is at least one specially-equipped classroom in each of Iowa's 99 counties. The ICN links colleges, universities, and secondary schools throughout the state and is funded by state and local funds.

IDEA is a collaborative effort of teachers and administrators from local school districts, the Iowa Department of Education, Iowa Public Television, community colleges, public and independent colleges/universities, and professional organizations. The overall purpose of IDEA is the appropriate infusion of live, two-way interactive telecommunications into the educational systems of the state. One component of the project is the Teacher Education Alliance (TEA). TEA's mission is to prepare present and future teachers to use the ICN for distance education. The first workshop for vocational teachers was held in the summer of 1993. Teachers from all vocational areas were invited to participate.

At the workshop teachers learned about interactive distance education, the fiber optic network, and the goals of the Star Schools project. They were provided experiences in teaching over a simulated network between two classrooms in the same building. Finally, they were asked if this type of distance education could be of value in implementing vocational curriculum reform in Iowa.

An important question had to be addressed before some would be willing to use the network. Will interactive distance education replace a teacher when two or more schools share a course? In Iowa, telecommunications cannot be the sole means of delivering a vocational education program. It can be used to offer any course, provided it is not the sole means for student/teacher instructional interaction. One solution is for the teacher to go to each site on a scheduled basis. The number of schools sharing a course is usually kept to three or less.

Once that question was answered, teachers started to see the possibilities. Following are some of the ideas they listed and are trying this year. The ICN can be used to:

• Offer advanced or specialized courses in schools that do not have sufficient enrollment to warrant offering the course in any one school. Examples in agriculture could include natural resources, environmental sciences, aquaculture, and horticulture.

• Allow two or more teachers located in different schools to coordinate and share a common set of courses originating from each school. Each teacher can take responsibility for teaching selected courses or they can work together to team-teach or turn-teach the same course. One type of course often mentioned for this type of instruction was core vocational

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Subject Index
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Author Index
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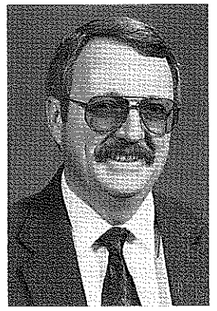
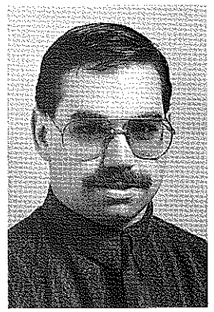
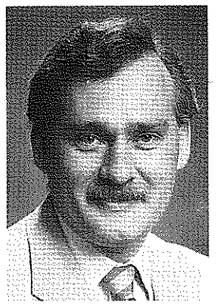
Interactive Video Networks In Secondary Schools







BY MICHAEL K. SWAN, MICHAEL L. KAMRATH, & MARK SCHMIDT

Dr. Swan is an assistant professor; Mr. Kamrath is a lecturer; and Mr. Schmidt is a research/teaching assistant in agricultural and extension education at North Dakota State University, Fargo.

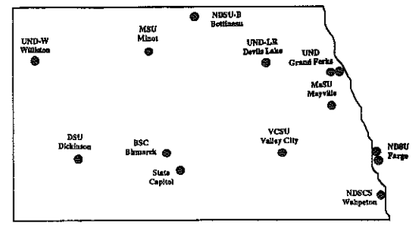
The North Dakota Interactive Video Network (IVN) allows people separated by great distances to see and talk to each other. Courses, meetings, and seminars can all be held by using the advances in communications technology. North Dakota was one of the first states to create a statewide system that allows multiple video interactive networking which connects two or more sites. The North Dakota IVN was the first step in a long-range plan to connect all corners of the state using contemporary communications technology. The medium is linked with a compressed video interactive system to all state college/university campuses, many secondary school campuses, and the state capital. The current furthermost point-to-point distance is about 420 miles (Wahpeton to Williston). This IVN system is a digital system which uses codes to transmit two-way audio and video over leased telephone lines. With this technology and availability, people don't have to travel great distances to start or continue their education.

A full-time job, a husband, and two children didn't allow one individual much time for travel to expand her two-year degree in medical technology into a four-year degree. Then she heard about the Interactive Video Network. Using IVN and correspondence courses, she earned a diploma from the University of North Dakota without having to move from her community or commute several hundred miles to the campus.

Several high school students, who are from remote schools and are enrolled in an independent study course, have learned about artificial intelligence and global warming by accessing information from libraries all over the country via telecommunications. In Wahalla, Mark Schmidt, agriscience instructor, taught an agricultural business management course daily to two schools and didn't have to leave his own school building. This allowed students in other districts to take advantage of agriculture courses which were not being offered at their home schools.

Turtle Lake Mercer High School agriscience instructor Tim Aichle is another IVN advocate. Tim teaches each term on the IVN system to other schools in his consortium who do not have agriculture programs. Thus, in North Dakota, we are exposing many more students to agriscience courses. This has resulted in increased enrollment in agriculture courses, allowing students in small remote schools the opportunity to learn about agriculture, and to increase the effectiveness of our teachers.

The one thing IVN has not done is eliminate teachers. In fact, it has increased the joint collaboration of educational programs for all students in North Dakota. Because of IVN, many students are able to receive courses they may not have been able to attend. Also it has allowed schools to remain open or avoid combining into consortiums. The state includes 14 regional IVN sites from which any secondary school consortium can access courses being offered via the IVN system. There are 16 additional secondary IVN consortium sites, including approximately 71 school districts. There are several other IVN consortiums currently in the developmental stages.



In the past few years, several agriscience instructors have enrolled in a master's degree program offered entirely through classes over the North Dakota Interactive Video Network system. Many of the instructors do not leave their own school building; they walk down the hall to the IVN classroom to attend class, actively participate in class discussions, are part of cooperative work groups, and become part of group interactions. Class notes and handouts are sent to these remote students via an in-state internet system called SENDIT. Their assignments are sent to the campus professor in the same manner, electronically.

Glen Weinmann, principal and agriscience teacher at Bisbee-Egeland, says, "This has been an excellent way for me to get my degree (M.Ed. in Agricultural Education and Specialist in Educational Administration). I've been able to save a summer at summer school, and will save more after this year. I can continually go to class rather than have to spend four or five

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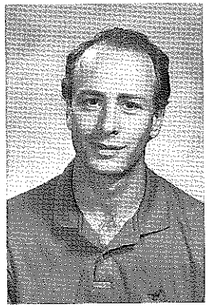
Upgrade to Humancentric Technology



BY ERWIN BERRY
Mr. Berry is an agriculture teacher at St. Marys High School, St. Marys, West Virginia.

The simplicity of graphic environments in operating systems has brought about an increased use of computers at home, in business, and in school systems. New computer systems have caused changes in hardware configurations and software use. There are many more decisions schools must make today pertaining to memory, MHz, and who to purchase a new computer from. Software can require from 1 to 4 MB of RAM and may require additional cards in the CPU to run efficiently. But after the initial purchase, computers are more useful and humancentric today than ever before.

In the past we expected high school agriculture students to memorize DOS commands and work through tedious feed formulation software. At best, young men and women were keeping financial records, accessing data banks, manipulating databases, and working with FFA software with IBM 8088 machines or the early Apple computers. And even though these machines of the 1980s are still compatible for much of the software we still use, it is someone's responsibility to expose our students to today's technology. Why not the agriculture department? In fact, more and more families don't rely on public education to keep them on the cutting edge; they have the technology at home.

Students at St. Marys High School demonstrate the capabilities of new computer technology to Alumni Association President Susan Bailey. (Courtesy of Richard Moore, St. Marys Oracle)

With the advent of CD ROM, it becomes increasingly important for agriculture teachers to use the resources at their fingertips. At St. Marys High School, being faced with tightening budgets and high prices of modern systems, the advisory committee sold the community on the needs of the local agriculture department and raised enough money through businesses, industry, and civic groups to purchase a 486 machine with a CD ROM, FAX, modem, hard drive, speakers, sound and video cards, and software. We then went after state and county vocational funds and faculty senate money to purchase an inkjet printer and more software. Though the amounts we received from each source was small, the initial investment was in excess of $2,500, which I consider small change compared to the dividends this kind of technology returns. Believe it or not, a portion of the money was encumbered last year from allocations that teachers didn't spend.

When administrators are considering funding, requests that are submitted in advance and apply to many individuals (youth and adults) surely will receive serious consideration. New technologies in schools bring about great public relations for agriculture students. We may not be in the fast lane of the information superhighway, but St. Marys High School agriculture students have access to the latest that the Pleasants County School System has to offer. On any given day, youth in the agriculture department will be obtaining current market prices for their hydroponic produce from Penn Pages, keeping records on the school farm with a spreadsheet application, recording fundraising data using a database, updating the FFA treasury records, completing FFA award applications, accessing curriculum by downloading information via modem, or faxing information to other FFA chapters. In an unstructured environment, students can rotate from the mechanics lab to the hydroponic greenhouses and to the computers to perform self-paced activities that apply to their SAEs or agricultural interests. Though many curriculums in a school can expose students to this type of technology, who is better poised to apply it to their lives than the agriculture department? There is currently a demand for semester courses that apply computer technology in a more in-depth curriculum than is now being offered.

Though it would be nice to have a room full of Pentium machines, the reality of that →

happening in my classroom is remote. Our support is good, but not that good. While I chip away at the wants and needs of the agriculture sector of our school, we make do with the old AT, XT, and PC2 machines to which we have access. They are better than nothing and perform adequately on much of the software we have, including WordPerfect and QuatroPro (DOS applications).

I have been fortunate enough to be involved with the newly established Technology Committee at my school this year. The committee consists of teachers, administrators, men and women from local businesses and industry, parents, and students. The group has impressed upon the local Board of Education that technology must be budgeted and updated annually, and professional commitment must be matched by financial commitment for all areas of education, not just agricultural education (I keep reminding myself).

This summer I will be involved in a workshop that will teach the integration of video laser disc players into classroom presentations. Since this type of technology is relatively new, that State Department of Education is sweetening the pot by supplying each school system with a video disc player and $1,000 worth of software—another example of why it's important to jump off that bandwagon and get in the lead! Additional technological goals of the St. Marys High School Agriculture Department include additional computers, notebook computers for when we are on the road, and increased use of satellite technology.

As educators, we need to guard against the common technology phobias among our peers. In the age of humancentric technology, our students sometimes may be our mentors. I recommend that teachers attend as many seminars and inservices as possible. This is an important way to upgrade their personal RAM and MHz. Subscribing to computer magazines and upgrading hardware and software whenever possible will help us send students out into the world a little better prepared than their competitors. Like technology, educational funding and availability of grants continues to change; therefore, teachers also need to stay abreast of changing policies and guidelines.

As we all know, the computer does not replace professionals. It is a tool, and a valuable one if we make it so. At St. Marys High School, I hope we will always be beginning a new phase in some type of technology, using all the tools we have at our disposal. We are an educational institution. If we are not training young men and women for today and tomorrow's world, then what is our purpose? ■

The Information Highway . . .

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courses. Tech Prep courses, workplace readiness courses, and courses articulated with community colleges were also listed.

• Use resource people and guest speakers who cannot make personal appearances to all interested schools . A resource person can be shared by several schools at the same time. This arrangement can save time and money. Students have the opportunity to interact with experts who may not otherwise be able to come to their school for a presentation.

• Provide a way to offer inservice programs for teachers with a common interest but separated by distance.

• Provide a way for student organizations to meet or to accomplish common goals.

• Allow cooperative learning between schools. This year two teachers decided to share a unit involving drawing plans, building, and testing a model. Students from one school were on the same committee with students from the second school. They had to work cooperatively in every phase of the project. Students learned how to communicate effectively with each other at a distance to accomplish a goal. This activity is not unlike the way projects are completed in the corporate world where company divisions may be located in several places around the world.

This year, vocational teachers across Iowa are trying out these ideas, as well as a number of other innovative approaches. They are sharing the results with other teachers at conferences and professional meetings. The first returns look promising. Teachers report that they feel positive in using interactive distance education in their efforts to improve the quality of vocational education in Iowa. Advanced and specialized courses are being offered. Cooperation between teachers from different schools is taking place. They emphasize that this delivery method has not made their job any easier, but the dividends in increased student interest and involvement make the effort worthwhile. At a recent conference on Tech Prep, one teacher who is using the system made the following observation to the audience: "With the new ICN, I am not alone anymore. I work with another colleague at the other school. Our schools are 50 miles apart. We share ideas and approaches in ways that were not possible before. I intend to use it from now on."

The second workshop for vocational teachers is scheduled for the summer of 1994. Teachers who used the ICN this year are going to relate their experiences to other teachers who have expressed an interest in using the system next year. Are we going to offer the workshop over the ICN? Of course! ■

ERIC: A Valuable Program Improvement Resource

BY WESLEY E. BUDKE

Mr. Budke is associate professor in the Department of Agricultural Education at The Ohio State University, Columbus.

The ERIC database is a resource of nearly 800,000 education-related documents and articles, but it is often overlooked as a source of valuable program information by teachers, administrators, curriculum developers, and teacher educators. The majority of its documents are identifiable and available only through the ERIC system. New compact disk and telecommunications technologies are making access easier.

What is ERIC?

The Educational Resources Information Center (ERIC) is a nationwide network, sponsored by the U.S. Department of Education, designed to collect educational documents and make them available to teachers, administrators, researchers, students, and other interested persons. The ERIC system consists of 16 subject-oriented clearinghouses, adjunct clearinghouses, and support services. Together they cover all aspects of education. Of particular interest to agricultural educators is the ERIC Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) located at the Center on Education and Training for Employment at The Ohio State University.

ERIC publishes a monthly abstract journal, *Resources in Education* (RIE), which announces all documents that are acquired by ERIC and that meet its selection criteria. *Current Index to Journals in Education* (CIJE) is a monthly index of approximately 1,500 journal articles from nearly 800 periodicals. ERIC attempts to acquire all recently completed significant documents dealing with education. *The Agricultural Education Magazine* is one of the many vocational education-related journals indexed by ERIC.

Documents announced in RIE (except for some copyrighted materials) can be purchased in microfiche or reproduced paper copy from the ERIC Document Reproduction Service (EDRS). EDRS sends complete sets of ERIC documents on microfiche to over 1,000 standing order customers in this country and abroad. All documents announced in RIE must be available to the public, either through EDRS or through an alternative source. The ERIC database includes more than 790,000 bibliographic records of documents and journal articles dating back to 1966. ERIC adds some 2,600 records to the database each month.

Why Use Eric?

ERIC is a source of relevant, inexpensive, and easily accessible information and products. Many are "fugitive documents" such as research reports, program descriptions, conference presentations, instructional materials, and handbooks that are not available from commercial or other sources. Many of these materials can be readily adopted or adapted for local use.

How Can the ERIC Database be Accessed?

Manual access to *Resources in Education* (RIE), and *Current Index to Journals in Education* (CIJE) is available at most college and university libraries. The major vendors of online and compact disc retrieval services also provide access to the ERIC database and help to make it one of the most popular and lowest cost databases offered. Technology such as CD ROM and the Internet have greatly improved access. Searching by CD ROM is now available at many university and state libraries free of charge. The CD ROM files are updated quarterly to ensure timely and accurate information. ERIC is one of the first major commercial databases to connect with the Internet. Currently, ERIC is available on the Internet through Syracuse University, Auburn University, the University of Saskatchewan, and the University of North Carolina at Chapel Hill. Contact AskERIC on the Internet (askeric@ericir.syr.edu) for information on making the proper connections.

What Services and Products are Available?

The ERIC system provides a range of services to help use the database and to complement its information. All ERIC clearinghouses produce digests on topics of current interest that include references for more reading. Some develop mini-bibliographies with annotated citations of items in the database. All clearinghouses produce monographs featuring trends and issues, synthesis papers and annotated bibliographies. Many clearinghouses offer newsletters.

The ERIC Clearinghouse on Information and Technology at Syracuse University operates AskERIC, an Internet-based electronic information assistance, help, and referral service.

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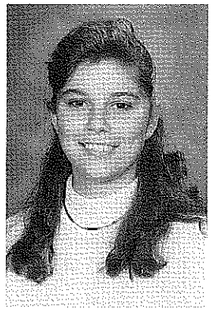
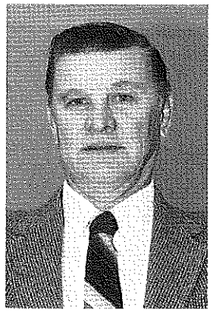
Center for Agricultural Science and Environmental Education





BY AMY ARMSTRONG & JOSEPH CVANCARA

Ms. Armstrong is a recent graduate of the Center for Agricultural Science and Environmental Education, Salmon Creek, WA. Dr. Cvancara is professor of agricultural education at Washington State University, Pullman.

An innovative new program is under way in Battle Ground School District, located in southwest Washington. This program is receiving considerable attention throughout the country and may serve as a model to future programs in agricultural science and environmental education.

Salmon Creek Center is located on an 80-acre site leased from the State Department of Natural Resources. The C.A.S.E.E. Project (Center for Agricultural Science and Environmental Education) includes three buildings, a forested area, an organic garden and a stream that is a tributary to Salmon Creek.

Located on either side of the C.A.S.E.E. classroom building are the homes of the school district administration and a leased building containing the United States Department of Agriculture (USDA), the Soil Conservation Service (SCS), the Farm Credit System, Washington State University Cooperative Extension, the Farmers Home Administration (FHA), the Agricultural Stabilization and Conservation Services (ASCS), and the Clark County Noxious Weed Bureau.

Agriculture teacher Tim Hicks and science teacher Mark Watrin, who team teach the program, stress the importance of having these agencies and their experts close at hand. Their expertise is vital to students in providing pertinent information regarding questions or problems involving student research projects. Both teachers are unaware of any facility in the nation that has captured such unanimous support of all the governmental agencies within a community.

Hands-on, Experimental Approach

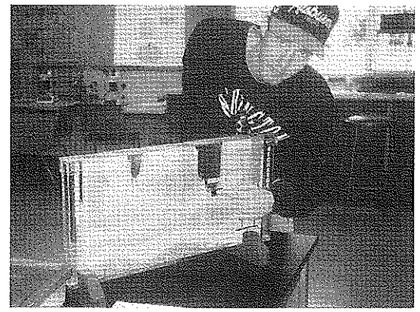
The C.A.S.E.E. Project serves approximately 40 students from two high schools in the Battle Ground School District. The facility eventually should serve about 70 students each year. During a three-period time block twice daily, groups of students are engrossed in individualized, practical projects which integrate learning experiences from the fields of agriculture, science, mathematics, environmental study, forestry, business, computer skills, and language. The goal of the project is to facilitate learning that is meaningful and emphasizes a hands-on, experimental approach.

C.A.S.E.E. is viewed as an alternative to traditional learning. Students receive three credits per semester, one each in English, science, and agriculture. Each student chooses a research area to study involving an agriculture, natural resource, or environmental science topic. To help collect information for their research, students use a modern technology lab complete with computers, color printers, CD ROMs, laser discs, color picture scanner, and Internet modems which allow students to access information. Students focus on self-motivation, collaboration with professionals, and accessing and evaluating information that is relevant to them. A presentation using multimedia technology complete with a portfolio of research is required to finalize each project.

Community Involvement

The key to the C.A.S.E.E. approach is community involvement. Several projects that have stimulated student interest involve landscaping, forest management, and salmon enhancement experiments. Some students have begun test plots for numerous grass seed varieties. Other students are involved in nature trails with interpretive signs to identify species of trees and other vegetation. There is a two-acre organic garden where students strictly apply organic fertilizers and biological pest control methods. The students raise and release ring-necked pheasants to replenish the population. Use of several different irrigation systems and bee research are other projects which are being developed at the Center.

Education for all ages is a focal point at C.A.S.E.E. With the assistance of experts from several governmental agencies and wide support from businesses and many individuals in the district, there will be a continuing number →



Student Scott O'Connell demonstrates a groundwater model showing how water pollution affects wells.

of projects awaiting students and the community in the years to come. Future plans include an animal science center, a greenhouse complex, and a nursery designed to serve as a demonstration of an environmentally sound facility for the production of ornamental trees and shrubs. Also in the long-range plans are an arboretum, ponds for wildlife habitat, a fisheries project, and an extensive water quality testing and management activity in Salmon Creek. Hopes are high that after an absence of 60 years, salmon runs could be re-established in the Salmon Creek watershed.

This is the first year for the C.A.S.E.E. project, and the future looks very bright. Students seem to enjoy the freedom and responsibilities of a land laboratory, and professionals like having the chance to work with pupils on mutually interesting subjects. It is an exciting and ambitious plan. Salmon Creek Center becomes an educational tool and model of interagency cooperation for the community, state, and nation. ■

ERIC: A Valuable . . .

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AskERIC is an alternative approach for getting help over the Internet. AskERIC will respond via the Internet with an answer within 48 working hours. Send your questions to Internet address askeric@ericir.syr.edu. In addition to providing answers to educational questions, AskERIC also provides the AskERIC Electronic Library (AEEL), which is a Gopher/FTP site of selected educational resources including ERIC Digests, lesson plans, network information guides, and bibliographies. To use the AskERIC Electronic Library, gopher to ericir.syr.edu.

ACCESS ERIC is another system resource. Reference staff can answer questions about the ERIC system and its services and products and refer you to the clearinghouses, which contain vast subject expertise in all fields of education. Call 1-800-LET-ERIC, Monday through Friday, 8:30 a.m. to 5:15 p.m. (eastern time) or access through the Internet (acceric@inet.ed.gov). Requests can also be made by writing to: ACCESS ERIC, 1600 Research Boulevard, Rockville, MD 20850.

ERIC/ACVE offers a variety of services and products of particular interest to agricultural educators including "ERIC Digests," "Trends and Issues Alerts," and "Myths and Realities." They also have a search service and a reference and referral service. For a list of available materials, write to Judy Wagner, ERIC Clearinghouse on Adult, Career, and Vocational Education, 1900 Kenny Road, Columbus, OH 43210-1090, or send a message to ericacve@magnus.acs.ohio-state.edu.

Why Contribute Materials to ERIC?

The contents of the ERIC database have been provided by teachers, administrators, curriculum developers, evaluators, and researchers. There are several advantages of having a document in the ERIC database. These benefits include publicity, product dissemination, retrievability, and continuing availability. A document does not have to be formally published to be entered in the ERIC database. In fact, ERIC seeks out the unpublished or "fugitive" material not usually available through conventional library channels.

There is a wide variety of documents that are appropriate for entry into the database. Examples include research reports, program descriptions, conference presentations, instructional materials, teaching and resource guides, curriculum materials, and handbooks and guides. For information on submitting materials, contact the Acquisitions Coordinator, ERIC Clearinghouse on Adult, Career, and Vocational Education, The Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210-1090 [(614) 292-4353 or (800) 848-4815] or Internet: ericacve@magnus.acs.ohio-state.edu.

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Money Management: A Financial Planning Curriculum

By Tammy Bartholomew & Bryan L. Garton

Ms. Bartholomew is an agriculture teacher at Archie High School, Archie, MO. Dr. Garton is an assistant professor of agricultural education at the University of Missouri, Columbia.

Agricultural educators have made tremendous strides in adapting curriculum to address our changing society. The influx of business management and other agriculture programs has provided a learning avenue for students of agriculture. In agricultural business management courses, emphasis is placed on teaching such concepts as opportunity costs, supply and demand, and profit margins. But where is the curriculum to teach retirement planning other than in the "time value of money" unit? How much time is spent on IRAs, TSAs, and 401Ks, not to mention how to read the business section of the newspaper?

To most high school students, planning for the future means planning for college or for employment directly out of high school. Encouraging students to think about financial security and retirement becomes a challenge when students are asked to describe a style of living they desire for themselves and then develop a budget for that lifestyle. Business courses at the secondary level may teach balancing a checkbook; however, managing money for future financial stability has not been a function of the curriculum. Statistics show that teens today collectively spend more than $65 billion annually and have an excess of over 3.5 million credit cards (College for Financial Planning, 1991). Preparing teens for the future by teaching them the basics of money management is essential.

The High School Financial Planning Program (College for Financial Planning, 1991) is a curriculum designed to teach secondary students the basics of money management. The curriculum is divided into five units, which may be taught in 6 to 18 weeks depending upon the depth the teacher wishes to teach the material. The purpose of the program is threefold: (1) to teach students about the financial planning process; (2) to give students the opportunity to apply the process through exercises provided in the units; and (3) to encourage students to begin to take control of their finances. The first unit in the financial planning curriculum is an introduction to financial planning. The goal of the unit is for students to gain a basic understanding of the steps in the financial planning process, including goal setting and decision making. A foundation is laid for the following units by emphasizing that effective money management is a disciplined behavior. The introductory unit begins by asking students how many of them would be interested in retiring at the age of 55 with one million dollars prior to taxes. The example of retiring at age 55 illustrates that to succeed in achieving one's goals, an individual must develop and follow a financial plan. This motivational tool also emphasizes the importance of maintaining a balance between satisfying today's wants and needs while planning for future wants and needs.

An essential concept students should learn from the second unit is that one of the single greatest assets an individual has in his/her lifetime is earning power from either a chosen profession or from talents and skills. The second unit provides for comparing the relationship between earnings and education, training, and experience. Career selection is presented as one of the primary variables for financial planning, and extended time can be spent on evaluating career opportunities. Analyzing payroll deductions is one of the learning activities provided with the second unit to help students determine the resources available for spending objectives. Students are asked to develop a spending objective, then budget the amount of time and money needed to meet that objective. Supplemental objectives on tax management, such as tax-deferred saving opportunities and applicable tax forms, are provided in the instructional materials.

Managing income and credit effectively appears to be a major concern in today's society. An estimated 98% of the general population spends their earnings within one week of payday; we are a society in need of financial management training. Unit three of the financial planning curriculum stresses budgeting and credit planning. Developing credit worthiness, as well as exploring the financial implications of debt, are objectives of the unit. Young adults find it easy to obtain credit, but they are not able to manage monthly interest and principal payments. Determining wants versus needs is a critical factor of credit management, since credit is a convenience that allows individuals to enjoy certain benefits now that will have to be paid for later. Following a spending plan (budget) assures young individuals the ability to meet financial obligations.

Protecting assets against personal and financial loss is yet another important factor of financial planning. As assets are accumulated throughout life, they need to be protected →

against personal and financial loss through the use of risk management techniques. Identifying the types of insurance and describing the principles of the insurance industry are yet other functions of the financial planning curriculum. Utilizing current events such as Health Care Reform and recent natural disasters, while pulling samples of costs of these catastrophic events, drives home the idea of asset protection in the fourth unit of the curriculum.

The fifth unit of the curriculum focuses on savings and investments. Students gain insight on how to put their money to work for them and investigate available investment opportunities. The unit utilizes the principle of "time value of money" found in most agricultural business management curriculums. Following the lesson on the financial planning pyramid, which gives a pictorial representation of the lowest to highest risk alternatives, students can study the business section of the newspaper and complete a simulation in investing $10,000 into stocks, bonds, or mutual funds of their choice. The importance of diversification is stressed during this lesson on interpreting newspaper data. Students use a nine-week period to follow the markets and interpret the data collected. Required with students' investment logs are articles pertaining to their investments and line or bar graphs showing stock movement. It is important during this time to invite resource persons such as financial consultants and investors into the classroom to support the lesson.

Taking control of your own financial plan provides the student the opportunity to incorporate the basics of units one through five into an individual financial plan. Students must develop budget worksheets for their individual situation and identify resources that will be used to achieve specific financial objectives. The High *School Financial Planning Program* (College for Financial Planning, 1991) curriculum recommends a plan where goals and objectives are met within a time frame of one to two years. This can be altered by having students use a time frame of 6 to 10 years. A student must include in his/her plan a career choice and a style of living based upon this career choice. A student's career choice can be utilized to support and complete a personal budget showing realistic living expenses on his/her projected salary. In addition, a student must include in his/her budget a set amount for personal savings. This requires some extensive research on the student's part and establishes a way for the student to plan beyond high school and college.

The High School Financial Planning Program (College for Financial Planning, 1991) curriculum is available free of charge to public and private schools. It is designed for easy classroom implementation and can be easily incorporated into an existing agricultural business management class or can be expanded to a course of its own. An instructor's manual and student workbooks with prioritized objectives, transparency masters, learning activities, student assignments, and exams are included in the materials. The curriculum plays a fundamental role in educating students about financial planning prior to being confronted with adult financial responsibilities.

Reference

College for Financial Planning. (1991). *High School Financial Planning Program.* Denver, Colorado. ■

Interactive Video. . .

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summers on campus. The instructors do a good job of making sure people at other sites are involved—through cooperative work groups. IVN is a great tool. It's allowed me a lot of flexibility and made my home life a little easier."

These students, and literally hundreds of others across the state, are participating in distance education—a learning situation in which teacher and learner are geographically separated from one another. There's nothing new about that concept. Universities have been offering correspondence courses since the late 1800s. Primarily a rural state, North Dakota has long had a need to provide educational opportunities to its citizens in remote areas. ■

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How Flexible are Our Programs?

BY JIM WILSON
Mr. Wilson is an agricultural mechanics instructor at the Nevada Area Vocational-Technical School, Nevada, MO.

Individualized instruction, cooperative learning, Tech Prep, open-entry/open-exit, integrating academics, class within a class—where does this all lead and where will it end? Hopefully it will lead to better learning and will end with a better educated public. What do these topics mean to our programs? It means more students, a wider range of student abilities, adults and secondary students in the same class, and the need for more flexibility.

You might ask, "How can we be more flexible than we already are? We teach such a variety of topics now." If we step back and take a close look at our programs, what do we really see? Do we see a program that will allow for a variety of student types, a variety of interests, and students coming and going at any time? Do we see a program taught by one teacher, or do we see a program flexible enough to use the expertise of other teachers for units or lessons they can teach better than we can ourselves? Do we see a program where we can teach our students and students from another class at the same time? Are we flexible enough to teach multi-area classes? What about two classes at once?

When we look at our students do we see as many ways of learning as we have students? Does the way we teach reach the learning styles our students possess? Do we maximize student learning and challenge the abilities of each student? Are we teaching the students something that will transfer to all occupations? Are we able to teach male, female, minority, and handicapped students all at the same time at different levels with different abilities and interests? Is the curriculum designed to meet the needs of academically disadvantaged, learning disabled, behavior problem, normal, and gifted students all at the same time? Does the curriculum contain competencies in English, math, science, communications, business, computers, and similar areas?

Do we as teachers have the flexibility to teach the different areas? Do we have a tendency to teach only the areas we are the most qualified to teach or the areas we are most comfortable with teaching? Do we want to take the time to upgrade our skills and expand into unfamiliar territory? Do we have the desire or the abilities to get administrative, parental, and community support for our programs? Can we get the materials we need to teach all we need to teach, or do we have to "make do the best we can with what we've got"? Can we make do with what we have?

How flexible are our facilities? Can we accommodate increased student numbers? Will we have to find innovative ways to adapt to higher enrollments? Will we have to have more classroom space? Can we motivate more students? Do we want to? Will there be more paperwork? We already feel we have too much paperwork now.

I have asked a lot of questions but have given no answers. Our programs will be as flexible as we let them. Our programs are changing. We have to be flexible enough to change with them. It seems like every three to five years there is something "new" in education. We usually respond by calling the same old thing the new name. We need to think about what is best for our students and willingly make the changes that will benefit them the most. We have a tremendous responsibility to our students to give them the best education possible. If we are inflexible and resistant to change, we are robbing them of the best education.

Education has received a lot of bad press the past few years. If we had been more flexible, adopted changes that improved student learning, and stayed abreast with industry technology, we might not have gotten the bad press. Technology in education has been running about five years behind industry. With technology changing the way it is, the new technology we teach is already obsolete.

If we are to produce the best educated students, we are going to have to have the flexibility to learn and teach the new technology, or find someone who can teach it for us. We have to generate support for our programs the way they are or be flexible enough to let them evolve to where they can meet the needs of our students. ■

FIBER OPTICS

Light transmissions over glass cable. Digital transmissions provide large capacities for multiple channel activity. Can be simplex (one-way) or duplex (two-way) voice, data, and video service.

MICROWAVE

Point-to-point transmission system. Provides program audio and video plus capacity for additional voice and data material.

ITFS

Instructional Television Fixed Service is a point-to-multipoint transmission system. Provides program audio and video to the receive location with audio return. With proper equipment, receive locations can be almost anywhere within 20 miles of an ITFS transmitter.

SATELLITE

Point-to-multipoint transmission system. Provides program audio and video to many users over wide areas simultaneously. For response from viewer, telephone is used.

INTERACTIVE

Identifies live communications with either two-way audio and video or two-way audio and one-way video. This provides for question-and-answer interactivity.

NARROWCAST

Transmission of programs to a specifically defined audience normally using the newer technology delivery systems. Sometimes referred to as a target audience, a limited audience, or a "narrow" audience, hence the name "narrowcast."

from the Iowa Educational Telecommunications Network