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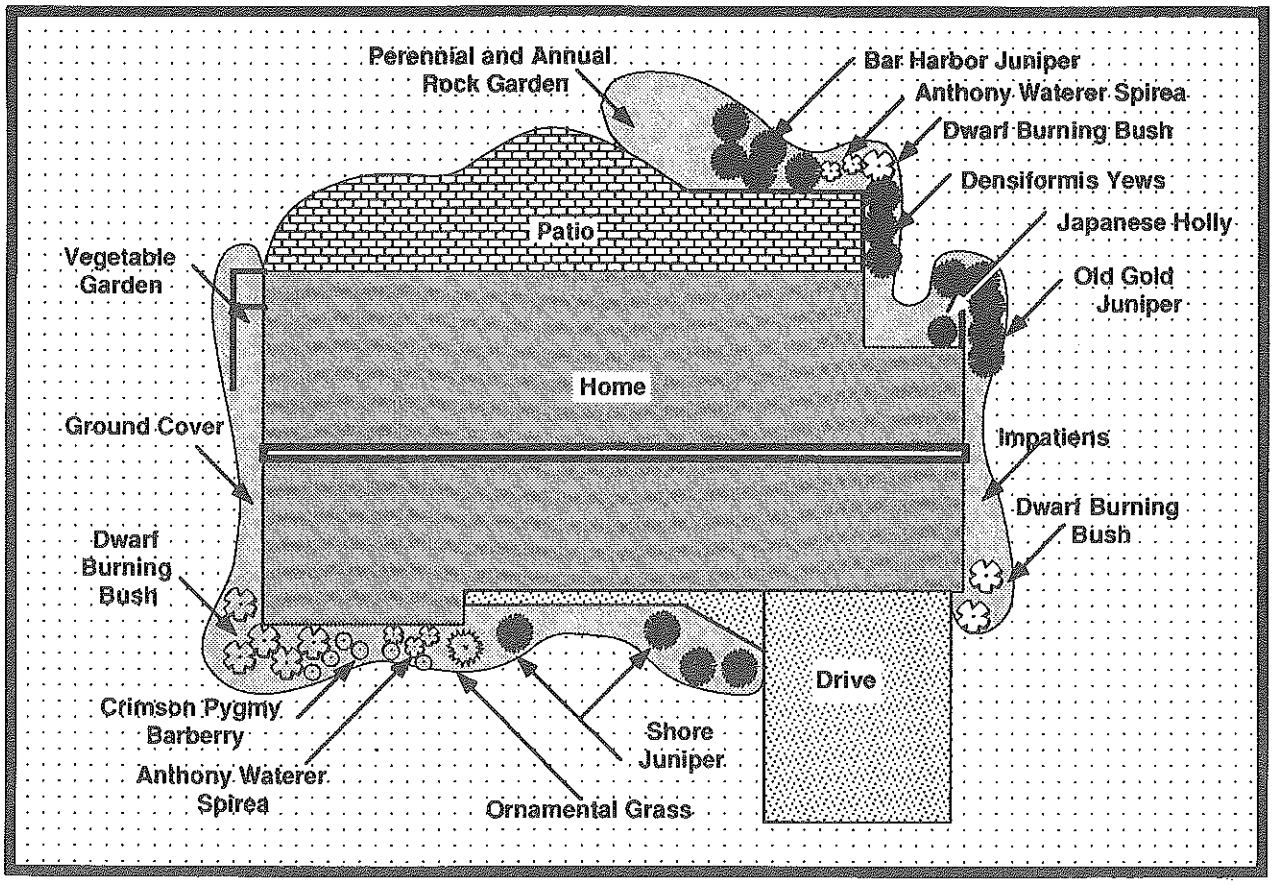

Theme:

THE
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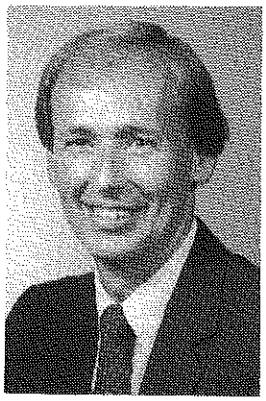
Teaching vs. Managing Instruction With Computers



By ED OSBORNE, EDITOR

Dr. Osborne is Associate Professor and Program Chair of Agricultural Education at the University of Illinois.)

For nearly 20 years now, we have had the opportunity to use computers in education. I can clearly recall a conversation I had with a student colleague during my first few days as a doctoral candidate at Ohio State in the fall of 1980. This person claimed that within five years a vast majority of instruction in the nation's public schools, both elementary and secondary, would be computer based. I felt extremely inadequate, since I had not used computers at all in my previous four years of high school teaching and had never even used a microcomputer myself. Eleven years later, I would judge this prediction as partially correct but extremely optimistic.

Today we see computers in every school, and rarely do we see teachers that do not use computers to somehow perform their teaching role. But we don't see computers in every classroom, and we don't see very much computer-based teaching, in agriculture or in other classrooms in the schools. Teachers at all levels, elementary through university, have become expert at using computers to manage their teaching activities, but by and large they have been unable to make the quantum leap into actually teaching with computers.

***Inservice and preservice programs for agricultural educators must place greater emphasis on using computers in* teaching.**

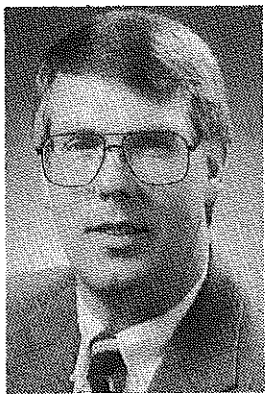
We know today that nearly all agriculture teachers have access to computers in their schools, but for the most part these teachers have one or two machines in their office or classroom and the pretended option of using the school's microcomputer lab when desired. In reality, agriculture teachers, like other teachers in the school, do not march their classes of students to the microcomputer lab for teaching and learning activities. It's unfamiliar territory, it's someone else's classroom, and it's a hassle. Besides, the computer lab is always scheduled with classes, so there is never an open period when your classes can use it. If agricultural educators want to significantly use computers in their teaching, and we must, then the only option in many cases is to slowly create a computer lab in our own programs. If pursued as a priority, a 10 station lab could be established in most schools over a three to five year time frame.

We cannot afford to become programmers and computer literacy teachers . . .

Why don't we use computers more in our teaching? Many agriculture teachers have only one or two machines in their program, making computer-based teaching for an entire class practically impossible. Also, a large majority of teacher inservice has been directed toward strategies for *managing* instruction with computers, versus actually teaching with computers. Do we know how to *teach* with computers? Do we know what instructional computer programs are available and which ones are of acceptable quality? Can we resist the temptation of teaching our students *how to use computers* and instead focus on having them use computers as a medium in learning agricultural concepts and principles?

Like many other areas in agricultural education, we are on the brink of discovery; the oasis is just over the hill, but we can't quite seem to get to the top. We should be managing our instruction with computers, but the real game in town today is providing students with computer experience as they study and learn agriculture. We cannot afford to become programmers and computer literacy teachers; we must focus on adapting and using available software as a resource in teaching agriculture. The challenge falls to teachers and teacher educators, perhaps more so to the latter. ➡

Computers in Teaching: A Decade of Experience



By ROBERT BIRKENHOLZ, THEME EDITOR

Dr. Birkenholz is an Associate Professor of agricultural education at the University of Missouri.

The use of computers in education has survived a stormy first decade. Following the introduction of microcomputers in the late 1970s, there has been a tremendous increase in the number of secondary schools seeking access to this new technology. Most schools began purchasing microcomputers at the rate of one or two machines a year, but during the peak demand period, schools purchased several new machines each year for a variety of uses. In recent years the demand for microcomputers in secondary schools has diminished. The demand for microcomputers in agricultural education has paralleled that of secondary schools.

Initially, the introduction of microcomputers in agricultural education was viewed with some skepticism. However, during the 1980s many teachers began to experiment with the new technology as availability increased. Recent observations indicate that agricultural educators have adopted microcomputers as one of the tools used by educators to enhance learning among students. Other teachers have continued to utilize the capabilities of the microcomputer for word processing and administrative purposes, but have withheld the microcomputer from the classroom environment. Still other teachers have steadfastly refused to incorporate microcomputer technology in their approach to teaching and learning or program management. This observation exemplifies recognized theories related to the adoption/diffusion of innovations. Some teachers at one extreme have become innovators in adopting microcomputer technology, while at the opposite extreme a number of teachers have elected not to utilize the technology.

. . . mere access to equipment does not equate to utilization in teaching.

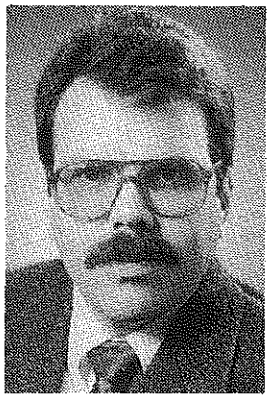
Research has shown that over 90% of all schools and 73% of all agriculture programs in the U.S. have access to microcomputers. However, mere access to equipment does not equate to utilization in teaching. The following barriers have been idenfied which have limited the integration of microcomputers into teaching/learning activities in secondary agriculture programs. ➡

Building New Bridges . . .

(continued from page 3)

University agricultural education programs must make students aware of good instructional software and teach them how to *teach* with computers, by discussion and by example. The same resource limitations that confront secondary teachers are also a problem for university agricultural educators. But we must find ways to overcome these limitations at all levels, or agricultural education may be viewed once again as "behind the times," not because of what we teach but because of how we teach. We do use computers in agricultural education programs, but for the most part we use computers for *managing* instruction or teaching computer literacy. Inservice and preservice programs for agricultural educators must place greater emphasis on using computers in *teaching*. We can effectively teach agriculture with computers, as the authors in this issue have proven from personal experience. Let's make *teaching* with computers a priority in our programs and enhance even more the new agricultural education of today. ■

Landscaping With Microcomputers



By CLARK HARRIS
Mr. Harris is a Graduate Research Assistant in agricultural education at the University of Missouri.

Technology is helping propel the landscape industry into the 21st century. Landscape architects are using computer-aided design (CAD) programs to produce precise, high quality architectural designs. Many landscape designers are finding the versatility of the high-end drawing/painting programs available for personal computers to be very adaptable to landscape design efforts. Landscape designers have found many valuable qualities in computer programs that are revolutionizing the landscape design industry.

Agriculture courses that teach landscape design should utilize the new technologies available. Courses that provide instruction in landscape design may be taught at the secondary or postsecondary level. Secondary students are capable of learning the principles of landscape design, but some students lack the artistic ability to draw and letter high quality landscape designs. Compared to hand drawings, computer drawing/painting programs can assist students in preparing better landscape designs.

Improvement in students' design abilities will increase their self-confidence levels. This increased level of confidence will give students encouragement to continue improving their skills. If students lack artistic ability, it does not mean they lack creative flair or a knowledge of ornamental plants. It may be a lack of fine motor skills. Disabled students can also learn to landscape using computers adapted to their needs. ➡

Computers in Teaching . . . *(continued from page 4)*

Barriers To Computer Use

- limited funding for hardware, software, and inservice.
- low priority of microcomputer-assisted instruction among teachers, administrators, boards of education, and parents (unity is important).
- limited time for learning and adapting the new technology.
- reluctance to change after unsuccessful initial experience or speedy obsolescence of the equipment.
- lack of central leadership to provide concrete recommendations regarding initial hardware and software selection.
- lack of resource assistance at the local level to address the problems of teachers who desire to utilize the new technology.
- lack of teacher preparation regarding the use of microcomputers in classroom teaching.

Teachers approach teaching from their own unique perspective based on previous student, teacher education, student teaching, and mentoring experiences. Few teachers have had the opportunity to observe classroom instruction which utilizes microcomputers. Therefore, recognizing that teachers model behaviors which they have previously observed, it should come as no surprise that few teachers have attempted to utilize microcomputers in their classroom teaching procedures.

Teacher educators and inservice instructors should take a leadership role in demonstrating by example how microcomputers can be used in teaching. Modeling such behavior is a necessary preprequisite to developing a cadre of teachers who are comfortable in utilizing the capabilities of microcomputer-assisted instruction in their classrooms.

The theme articles presented in this issue provide examples and guidelines related to the use of microcomputer technology. Each of us should make a commitment to increase the degree to which we model the use of microcomputer technology for our students. In so doing, we will have made a contribution to the technological literacy of our students which will become vital to their success in the high-tech work environment.

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Wolk, R.A. (Ed.) (1991, January). Teaching with technology [Special section]. **Teacher Magazine, 2** (4), p. 29-57. ■

Improving Accuracy

Computer drawing/painting programs enable students to become more accurate in their designs. Students using computers can be more accurate in drawing shapes and lines to the proper size and scale. If lines or shapes are incorrectly placed, they can easily be moved or redrawn using some of the computer drawing/painting programs. If lines or shapes are incorrectly sized, they can be corrected just as easily. The accuracy of the computer also improves the neatness of student designs. Smudges and tears from excessive erasing are eliminated with the use of computers.

Alternative Solutions

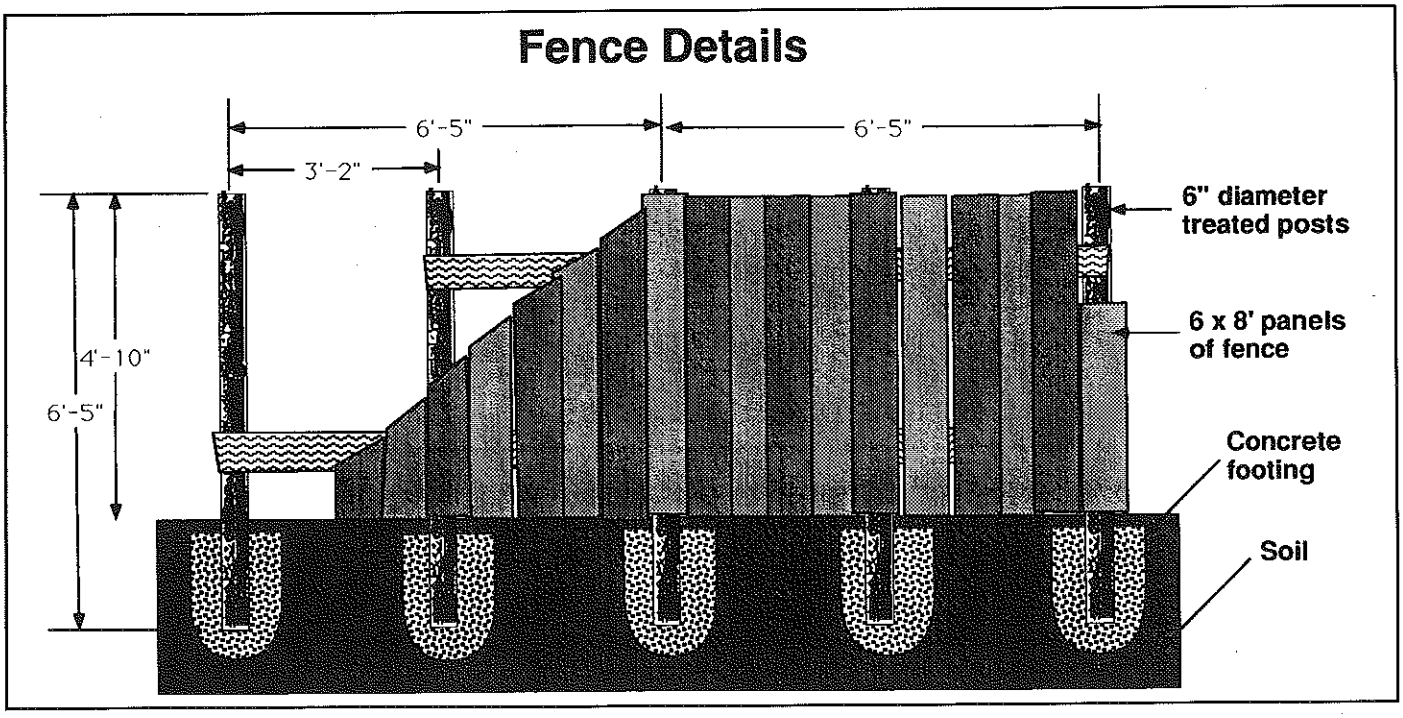
Part of the learning process in landscape design is to learn from previous design mistakes. Many of the computer drawing/painting programs available for personal computers can facilitate quick changes in design plans. This means that corrections suggested by the instructor can be quickly made on the drawings, without having to redraw the entire design. The ability to change design plans allows students to explore alternative solutions to a landscape problem. This encourages more experimentation and creativity in student projects. Students who are required to identify alternative solutions to landscape problems will find themselves becoming more creative.

Reduce Tedious Repetition

Computer drawing programs can help reduce tedious, repetitive actions frequently required in the preparation of landscape designs. This could include drawing extensive planting areas, containing many plant symbols. It might mean drawing large surfaces with patterns such as brick or decking materials. Some computer programs can store symbols in macro files or scrapbooks. The type of macros discussed here are line art images stored in files and accessed through pull-down menus. These symbols can easily be copied from macro files or scrapbooks as they are needed for designs.

Symbols might include different types of plants, people, animals, fencing, furniture, or anything else that may be used in landscape designs. Line art can be stored and used in a front or perspective view. Symbols can be stored to use in the plan view. These pictures and symbols can be quickly duplicated with the computer. Some programs will permit symbols to be easily enlarged or reduced to make appropriately-sized symbols for different types of plants and for different scales. Symbols can also be stretched or distorted to create new shapes. Patterns such as brick, stone, or decking materials can be placed as a fill pattern in any shape.

The repetitive task of producing several parallel lines or similar shapes is also reduced by the ability to duplicate shapes. An example might include the circles and arcs used to represent spray heads on a sprinkler system. These shapes can be easily duplicated with some drawing/painting programs. ➡



Increased Speed

The ability to complete repetitive tasks quickly, along with the ease of correcting mistakes, can greatly improve student speed in completing landscape design plans. This is very important with secondary students. If projects take several weeks to complete, students may become frustrated with the landscape design process. More learning can occur if several computer landscape designs are completed in the time that it would have taken to complete a single hand-drawn design to the teacher's satisfaction. The more opportunities to apply landscape principles, the better the principles will be learned. An increased number of landscape projects will allow students to work through mistakes in their designs to improve their design capabilities.

Design in Scale

Another benefit of some computer drawing/painting programs is the ability to create the design to scale. The scale can usually be easily altered for different landscape situations. Length, width, and area can be shown as they are being drawn or can be quickly determined. The ability to calculate the size of an area provides assistance in estimating lawn areas and costs for installation materials. This is also beneficial when figuring the volume of an area where concrete is to be poured.

Quality Lettering

Quality lettering is essential in landscape design to help landscapers express ideas that are drawn on the designs. Professional lettering of landscape designs is an art in itself. For students to have professional looking designs they need neat and professional appearing lettering. Computers enable students to quickly produce quality lettering in their designs by selecting a font type and changing the size and qualities of the font to fit their needs. For secondary students to produce quality in hand-lettering could require extensive practice over a long period of time.

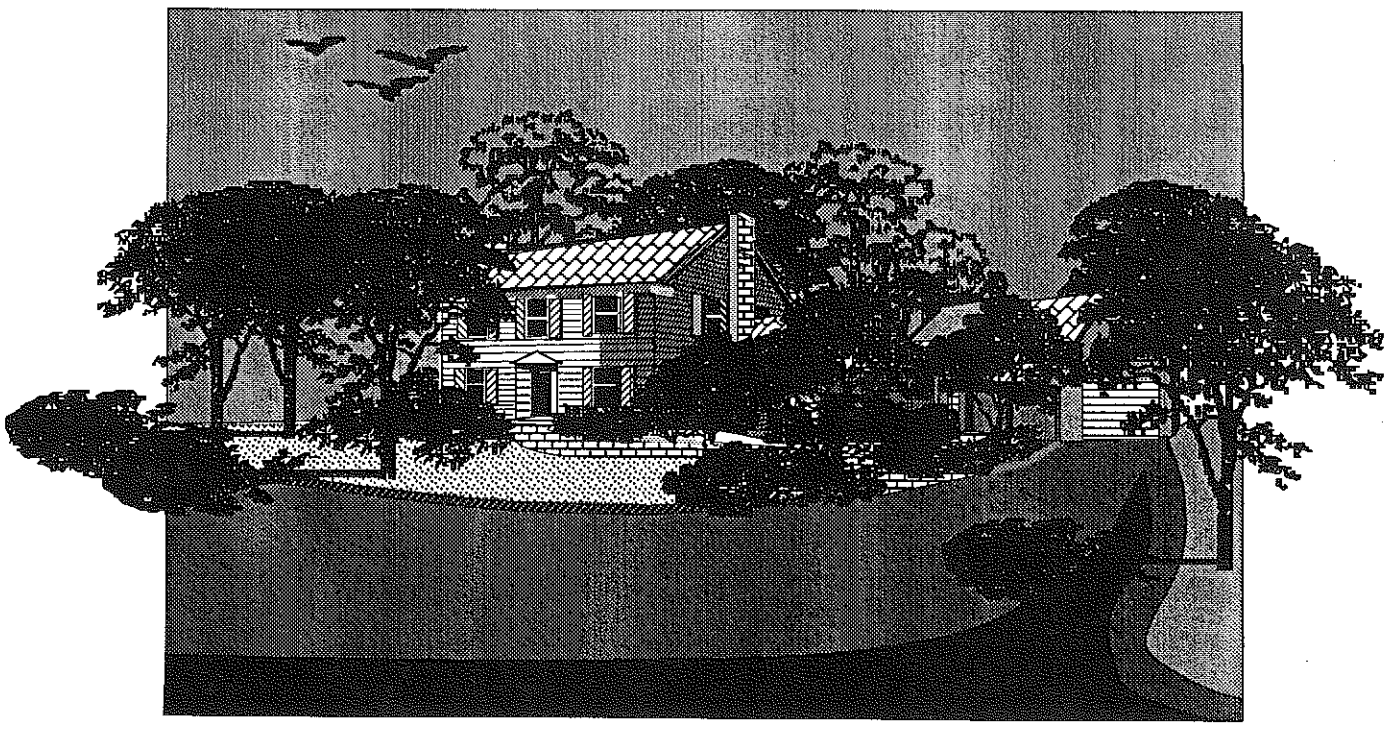
Scanning Images

Scanners can be used to scan items to incorporate them into landscape designs. Photographs or drawings of homes, buildings or plants can be scanned for use in plan views or perspective views. Symbols can also be scanned and saved in macro films or scrapbooks. Scanned photos of individual homes can greatly personalize landscape design plans. This can give a realistic view of how a finished design will look. Systems are also available to select still frames from videos.

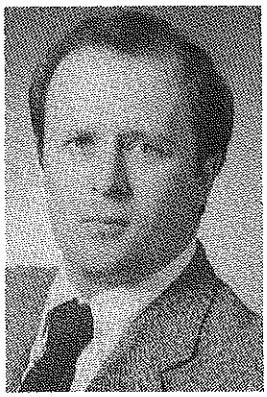
Perspective Drawings

Programs are available for personal computers which create three-dimensional (3-D) images. These programs have merit

(continued on page 17)



Computer Simulations — Adding A Touch of Realism



By LEON G. SCHUMACHER and R. MACK STRICKLAND

Dr. Schumacher is an Assistant Professor of agricultural education and Dr. Strickland (not shown) is an Associate Professor of agricultural engineering at Purdue University, West Lafayette, Indiana.

It's 6:30 a.m., time to get up. You quickly run through your "to-do" list in your head. In the background you hear water trickling through the downspout. It's a soft, gentle, comforting sound, and rain is much needed by the community. Let's see, yes, today was the day that you had planned to show how to adjust a combine. You have scheduled a field trip to the Bill Johnson farm to show how to adjust a combine properly. Your lesson plan . . . your lesson plan is soaking wet!

The telephone rings. "Computer? Yes, the department has one. An old Apple IIe. What do I use it for you say? Well, mostly word processing and some limited use of spreadsheets and database programs. Do I have any application programs? Exactly what do you mean by application program? Oh, well, I do have a copy of Print Shop."

The first scenario occurs frequently for agriculture teachers. We have learned to adjust and to carry out plan "B" as the need arises. The second scenario is equally real. Some of you might add, "Well, we do pull it (the computer) out around contest time." Few teachers take full advantage of the capabilities of computers in their teaching. We all have good excuses — "Our department cannot afford any more computers, I can't find any software that I can integrate into my lessons," and many others.

Few teachers take full advantage of the capabilities of computers in their teaching.

In spite of all the "good" excuses, there are some very good computer programs available to use with agriculture students. Some of these programs come quite close to simulating actual work-related situations. The "soaking wet" lesson plan highlighted above could "dry out" with the aid of a combine computer simulation program available through John Deere educational materials. This program allows the user to adjust combine concave clearance, fan speed, chafer opening, sieve opening, and travel speed. Combine performance is monitored via your computer terminal. Instructors at John Deere's factory training school at Davenport, Iowa, and Wichita, Kansas, developed this computer simulation to teach combine adjustment to technicians. Imagine the amount of shocked grain that would be needed for a class of 24 technicians. Also, imagine how difficult it might be to secure 24 combines at $95,000 each for technicians to use during their training session. The capital outlay for the simulation program was much more cost effective. As an added benefit, the instructor(s) can visit with and monitor the class' progress at one time - during the operation and adjustment portion of the training program.

One can envision how agriculture teachers might use John Deere's computer simulation to literally "bail" them out of the wet scenario outlined. Because teachers can only work effectively with one or two students at a time (since they cannot physically be in two places at once), the simulation program would probably be superior to actually setting and running a combine. This is especially true when one considers the safety concerns that arise when more than one person is in the cab or working around a combine when it is operating.

A look at current computer-related research focusing on the use of computers in teaching agriculture indicates that student performance is **not** hampered when lessons are taught with the aid of computers (Birkenholz, 1989). In fact, Poe (1987) observed that students who used an electrical wiring simulation program scored higher on a cognitive examination than students who practiced their wiring skills using traditional hands-on methods. Poe developed, tested, and later marketed the wiring simulation program through the National Food and Energy Council. ➡

The cost of programs and the lack of computers, as pointed out earlier in this article, is a very real problem for agriculture teachers. However, John Deere, like other companies, has spent a lot of time, energy, and money developing and delivering technical updates and encouraging on-going training for John Deere technicians through local John Deere dealerships. John Deere calls this program "Pathfinder", and a large variety of technical information is available through this update program. Some dealers are willing to share these videocassettes, slides, and computer programs with high school students. The first step to take if you do not have the funds necessary to purchase the program is to contact your local John Deere dealer to see if they would order the software and allow you to use it with your classes.

. . . students who used an electrical wiring simulation program scored higher on a cognitive examination than students who practiced their wiring skills using traditional hands-on methods.

"I still don't know how we can get the computers we need." One possible strategy is to work closer with industry to find a solution to the problem. As an example, IBM has for several years maintained a computer resource warehouse for grades K-12 that is located in Atlanta, Georgia. An area coordinator for the National FFA Agricultural Mechanics Contest called and informed us that he planned to use a microcomputer in the problem solving area of the contest. We in turn called an IBM representative in Columbia, Missouri and explained our computer needs for the 1991 National FFA Agricultural Mechanics Contest. IBM responded positively within one week. Realizing that IBM normally restricts the use of this equipment, you may still work through local computer dealers who have, at times, been equally generous with their equipment. You can check with your local John Deere dealer who might allow you to use his facilities and equipment to teach a unit on combine adjustment.

We have only cited two examples of computer simulation programs for use in your classes. However, there are other programs available, and the conditions that prompted software developers to write these programs are still present today. The programs we have described are quite basic in light of what will be available in the near future. Multimedia presentations utilizing laser disks, CD ROM, interactive video, and audio are just a few of the advances being used presently to develop new educational programs. We encourage you to seek out simulation programs that incoporate these technologies and pass them to others in the agricultural education community. The benefits derived by the use of these technologies can be tremendous and may, in some cases, add a touch of realism that may not otherwise be possible.

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About The Cover

Computer-aided design is being used by landscape architects and designers in industry. Computer drawing/painting programs can assist students in preparing professional quality landscape designs. (Illustration courtesy of Clark Harris, University of Missouri).

Get "Hyper"active With Your Mac

By ROBERT TERRY, JR.

Dr. Terry is an Assistant Professor of agricultural communications in the Department of Agricultural Education at Texas Tech University.

For some thirty years, Professor George Cook taught the farm shop skills classes at Oklahoma State University. When I took the class, one of the early laboratory activities was a quick refresher of tool identification. As we worked our way through the tools, George would hold each one up, ask us to identify it, and then proceed to describe how it was to be used. As we got about half way through the list of tools, there was one that none of us in the class could find words to describe. After a multitude of bad guesses, George told us that this mystery tool was a "kinardly." Of course, that wasn't the real name of the tool. He informed us that it was our job to find the true identity and uses of this tool by the next lab session.

In the years since my experience in AG MECH 3222, I have run into several "kinardlys" — strange looking tools that have mysterious uses. In fact, I have found that kinardlys are not limited to the tool box. Even computers have kinardlys! One such strange looking, hard to describe tool, the Hypercard program, comes free with Apple Macintosh computers.

What Is Hypercard?

Provided with Macintosh machines since 1987, Hypercard is a program that can best be described as a software package arranged in a deck of cards that contain text, graphics, and even sounds. Each card has three elements: fields of text, graphics, and buttons. The cards are grouped into "stacks," which are similar to what might be called "files" in other types of software (Gray, 1989). The buttons are used to manipulate the stack to do things like starting animation sequences, playing sounds, or simply moving to the next card. To use a button, the operator simply has to place the mouse pointer on the button and click. All of the effects of the stack are controlled by clicking the mouse on a button. Each button has a script written in the HyperTalk language, which is easy to learn. In fact, HyperTalk accepts several different phrases to accomplish tasks. For instance, the following phrases can be used to move from one card to another:

Go to next card
Go next
Go next card
Go to next (Gray, 1989)

Even the simplest programming language for MS-DOS machines does not allow this kind of freedom.

Information in text fields can either be entered directly using the text tool on Hypercard or imported from word processor documents. Likewise, graphics can be drawn using tools such as freehand pencils, lines, boxes, circles, and various fill-patterns, or imported from other applications. Sound can be imported from files or recorded directly into Hypercard (if you have a Mac LC or Mac IIsi machine).

There are countless options for arrangement and format of cards. Several stacks are provided with the Hypercard kit and many more are available through Apple dealers and Macintosh user groups.

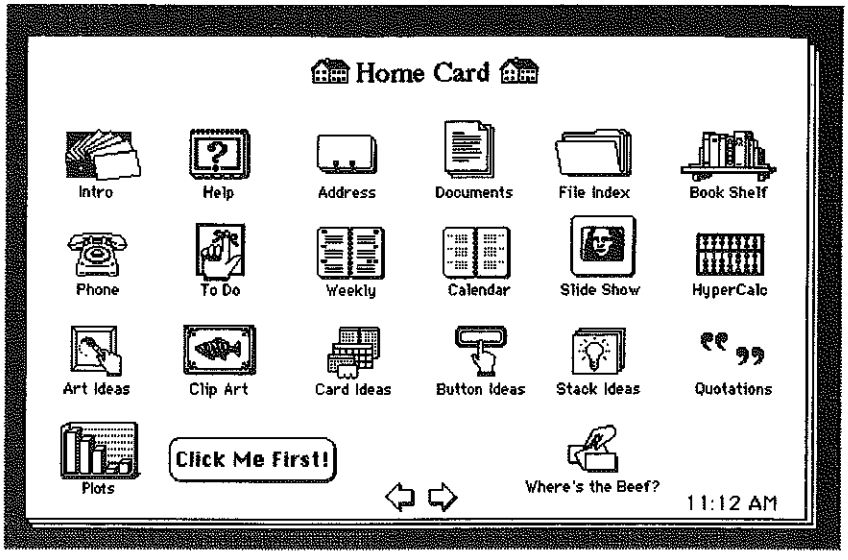


Figure 1: Hypercard home card.

Uses for Agriculture Teachers

The basic Hypercard kit contains stacks such as "Address," "File Index," "To Do," "Calendar," and "Phone," which can be very useful for program management. Teachers can use the stack as a format to develop a database for student ➡

information, physical plant inventory, and storage/retrieval purposes.

However, the greatest opportunity for agriculture teachers is the fact that, with a little training, home-made stacks can be developed for specific tasks. Through Hypercard, teachers can allow their students to work at their own pace in computer-assisted, individualized learning experiences. Stacks can be developed for nearly any topic and at various levels of ability. Students only need to know how to move and click a mouse.

An Example

The Hypercard stack "Where's the Beef?" was designed to help students learn about the location of the wholesale cuts of beef, as well as the retail cuts that come from each wholesale cut.

The learner begins with the "home card" (Figure 1) which can be thought of as home base. From here the student can click on any of the buttons to open a stack. For the Beef stack the student clicks the mouse on the button titled "Where's the Beef?" Then, the introductory card of the "Beef" stack appears with instructions of how to start the program. The student simply clicks the mouse as instructed on the card. After the click of the mouse, a card with a graphic outline of a steer is shown (Figure 2). Here, students are instructed to click the mouse on the part of the steer that they want to learn more about. For example, if a student clicked on the hind-quarter of the steer, a card highlighting the round would be shown for three seconds, then a card with facts about the round would appear (Figure 3).

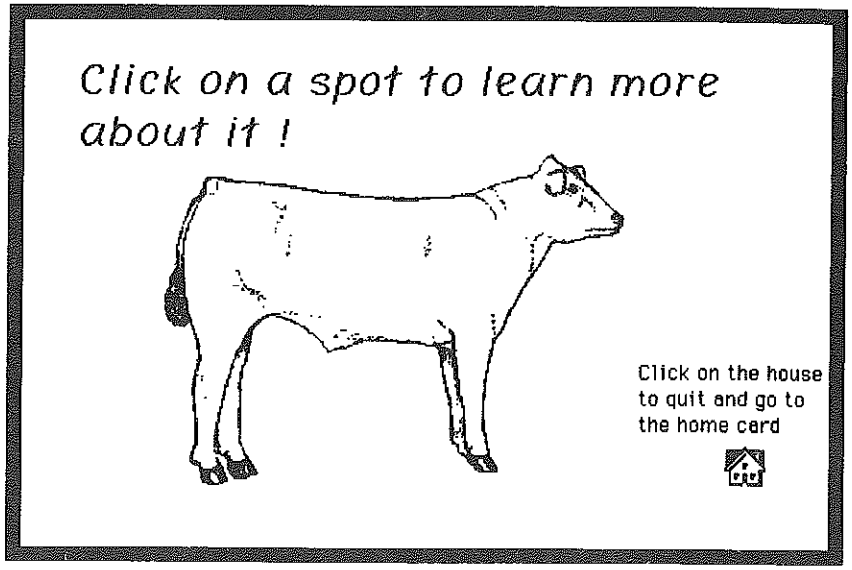


Figure 2: Wholesale cut selection card.

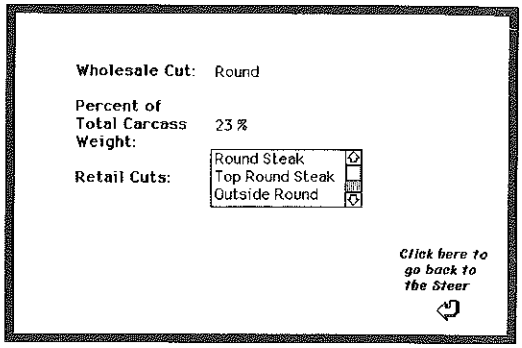


Figure 3: Information card for the round.

Students may study this information as long as they want and then click on the button in the lower right corner to return to the card with the graphic of the steer.

The student may study each of the other wholesale and retail cuts by simply clicking on other parts of the steer. Clicking the mouse in any of the areas of the wholesale cuts causes the sequence outlined above to take place.

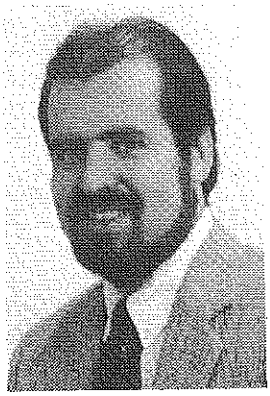
There are also some extra, entertaining features built into the stack. For instance, if a student were to click the mouse on the nose of the steer (and you know they would), an audio recording of a "moo" is played by the stack. Likewise, other interesting sounds and graphics appear when other areas of the steer are clicked.

"Where's the Beef" is very basic and unsophisticated, as far as Hypercard stacks go. Other stacks for agricultural educators have been developed as well. The options, features, effects, and uses of Hypercard are virtually unlimited.

Want to Know More?

The greatest limitation to Hypercard seems to be the programmer's ability. Fortunately, there are several resources available to train Macintosh users to develop stacks. Books, such as **Hypercard 2 in a hurry,** and **Hypercard/Hypertalk,** are well written and have easy to follow examples. Several universities and community colleges offer classes on Hypercard or at least have faculty who are "experts." Finally, Macintosh user groups and bulletin board services provide helpful hints, as well as interesting stacks free of charge. To find out about user groups and bulletin boards, check with your local Apple computer dealer or the computer resources center at a nearby university. ➡

Teaching in a Computerized Classroom



By DAN WALLACE
Mr. Wallace is an agriculture instructor at Clinton Area Vocational-Technical School in Clinton, Missouri.

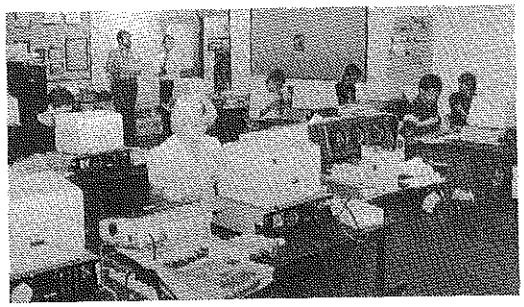
Enrollment in 1984-85 was down to 26 students. It was the height of the farm crisis, and students just weren't enrolling in the traditional, production-based courses at Clinton. The agriculture department owned one of the first four Apple II Plus computers purchased by the district and had recently received a portable Kaypro computer for use in the Adult Farm Business Management Analysis Program. Students were using these computers for individual study projects during the instructor's SAE hour.

In April, 1985, with local and state funds, 10 IBM PCs and other equipment were purchased to equip a laboratory for teaching agricultural business computer classes. Due to the offering of these classes, and other changes in the department, the 1991-92 enrollment has grown to 141 students. Since making these changes, Clinton's department has been featured in the *Kansas City Times "FFA Convention" Star Magazine, the Missouri Wallace's Farmer, National FFA Horizons,* and the *1990 USDA Yearbook of Agriculture.*

Agricultural Business Classes With Computers

Two computer-based agriculture classes are offered to Clinton students: Agricultural Business Management and Marketing and Agricultural Business Sales and Economics. Missouri curricula have been modified to add computer applications to every possible aspect of the curricula. The principle/method is taught manually, and then computer applications are created for those principles/methods. Both classes heavily utilize spreadsheet, database, and wordprocessing applications. The marketing class uses telecommunication software and a modem to retrieve market information from the University of Missouri's Agriculture Electronic Bulletin Board (AgEBB).

The department subscribes to the Data Transmission Network (DTN) by KU satellite. The receiver is connected to one of the local PCs. Market information is downloaded to diskette for data manipulation by the student. Students manually chart/graph the market information and then create Hi-Lo charts on a spreadsheet. This class also participates in the Newspaper In Education Stock Market game and uses the computer for researching stocks/commodities and tracking portfolios. Two years ago a student, as part of an individualized study project, created a local bulletin board for dissemination of agricultural information, public domain programs, and spreadsheet templates. That student won the state Computers in Agriculture Award and was a regional winner and competitor at the National FFA Convention. He is currently a college sophomore majoring in computer information systems with a minor in agriculture.



One of two agriculture classrooms was converted into this computer laboratory. Every two computers shares a printer through a databox. A video projector was purchased for group presentations. The original 10 Pcs have been expanded to 15 units.

Because of the computer instruction provided, these two classes are designated as "college bound." This has boosted non-traditional enrollment in the agriculture department. With the purchase of additional units, this class is currently taught with a 1:1 student/computer ratio.

Computers are used in other courses, including the agricultural career exploration class. Each computer has a career information program that allows students to ➡

Get "Hyper"active . . .

(continued from page 11)

References

Shell, B. (1988). **Hypercard/Hypertalk.** Management Information Souces, Inc.: Portland, OR.

Beekman, G. (1992). **Hypercard 2 in a hurry.** Wadsworth, Inc.: Belmont, CA.

Gray, R.A. Hypercard utilization in education: Possibilities and challenges. **Tech Trends,** 34 (1), 39-40.

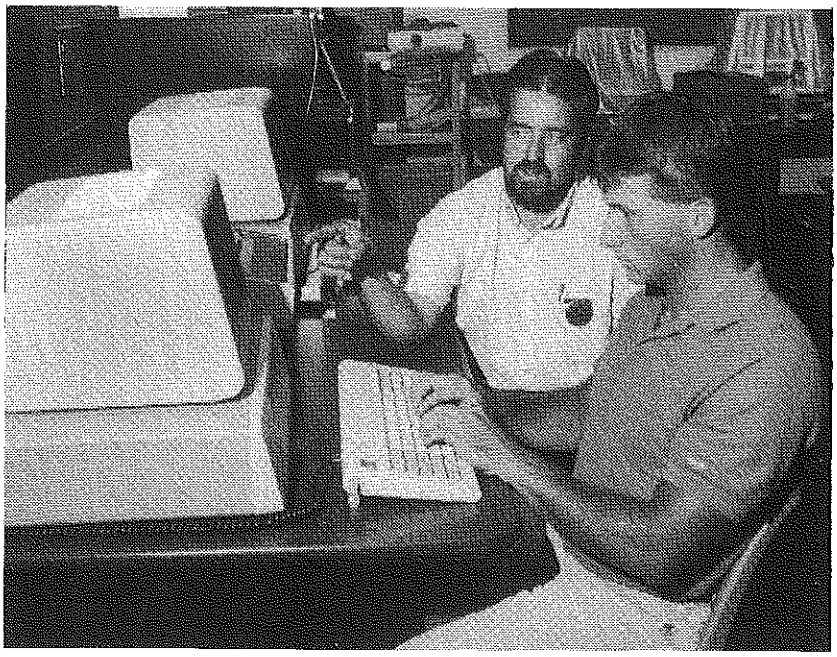
conduct a search based on their career interests. This computer program also has information on colleges — entrance requirements, degrees/programs offered, and estimated costs.

In the computer laboratory, drill and practice programs in areas such as mechanics and horticulture can be used by several students at one time. A disadvantage of individual stations for these programs is the cumbersome recording of student performance. A computer with VGA graphics capabilities was recently purchased for Computer-Aided Drafting (CAD) landscaping projects in horticulture.

Individual PCs vs. Networking

Agriculture students are more likely to work in an agribusiness or on a farm with an individual, "stand-alone" PC as opposed to working on a network. Students will learn Disk Operating Systems (DOS) management by using an individual unit. Software installation and configuration is less complex. Initial software and hardware expenses can be less expensive with "stand-alones."

As evidenced in another department, a networked laboratory allows the instructor to manage hardware/software from a central "file-server," thus saving valuable time. Students can easily share a high quality printer. Negatively, a network requires additional hardware, software, and training.

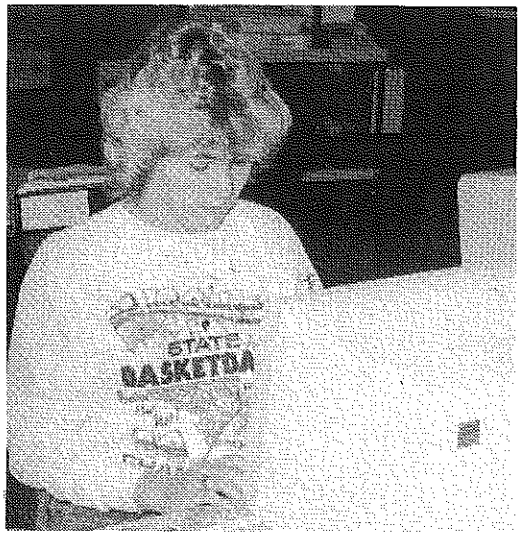


After taking agricultural computer classes, this student purchased a computer for home use. In addition to keeping SAE records on his swine and beef projects, he created applications to be used in the family seed processing business. His agriculture classes helped prepare him to enroll at the University of Missouri and major in agricultural economics.

Software Considerations

There are several more software packages to choose from today than were available in 1985. Manuals on our shelves show the evolution of spreadsheet software from Visi-Calc to Flash-Calc to Multiplan to Lotus. In 1985, there was not an affordable integrated software package available.

Software copyright policies must be understood by the instructor, and these policies may determine what software may be financially feasible to purchase. Some software packages allow for a site/lab license while other packages require individual copies for each machine.



This student's high school does not offer agriculture courses. She drove 50 miles a day to take courses in Agricultural Business Management and Marketing and Animal Science, and spent one hour each day in laboratory placement at a veterinary clinic.

Today, those purchasing MS-DOS systems for the first time should consider a program such as MicroSoft Works for use in the classroom and administrative/teaching applications. MicroSoft Works has word-processing-spreadsheet-database-telecommunications capabilities, and its spreadsheet can also read and write Lotus 1-2-3 worksheets.

Software instruction should emphasize the process/results of the keystrokes and not memorizing the actual keystrokes. A student who understands the mechanics of a spreadsheet will be able to adjust to any software package that they may operate in the future.

Hardware Considerations

The 1985 PCs had 256K of RAM, 2 floppy drives, and monochrome monitors. Those units have been upgraded to 640K ➡

of RAM, and 30MB hard drives have been installed. Although still having 8088 processors, the hard drives save time lost by shuffling multiple diskettes.

With less expensive technology, hardware purchases for departments in the future should include hard drives, 80286 or 80386 processors, color/graphics monitors, and both 3.5″ and 5.25″ floppy drives. Printer-sharing devices allow multiple computers to use a common printer.

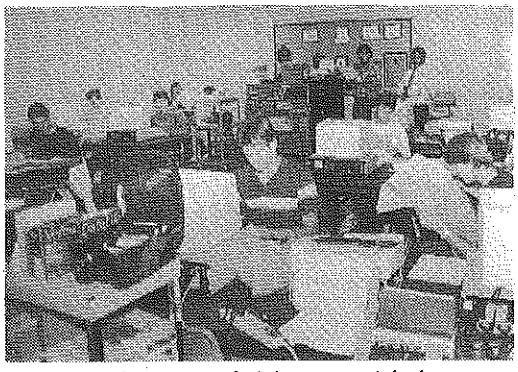
Repairs/Service

Just as a welder is a tool in the agricultural mechanics laboratory, a computer is a tool to teach several subject matter areas. Similarly, computers need maintenance, just as we must maintain our laboratory tools.

A computer laboratory/classroom is a component of the program that must be managed just like the mechanics laboratory, school greenhouse, or land laboratory.

Computer repairs in rural areas may be a problem. Until recently, our vocational school had a 24-hour response service contract on computer equipment. Due to budget constraints, those contracts have been dropped. A point to remember — service contracts may be more valuable during the later life of the hardware.

Whether the department has one or 15 computers, to reduce "down time" instructors must become comfortable in installing/replacing devices such as drives controllers, chips, or other components. A spare parts inventory may allow for the "trade-out" of components to be sent for repairs. When teaching with a 1:1 student/computer ratio, it is nice to have a spare unit to utilize if a computer cannot be repaired quickly.



At a time when some administrators might have considered closing the department, this administration took a chance, and saved the agriculture program by investing in this agricultural computer laboratory.

Conclusion

Not all schools will be able to have a computer laboratory solely for use by the agriculture department. Instructors in those schools need to be creative in utilizing existing laboratories in their districts for the benefit of agriculture instruction. A computer laboratory/classroom is a component of the program that must be managed just like the mechanics laboratory, school greenhouse, or land laboratory. A computer laboratory/classroom may not seem to fit into the scheme of your department, but it could be the salvation of your department, as it was in Clinton. ■

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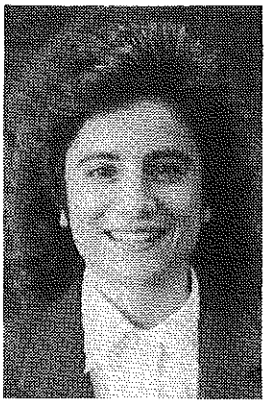
Using a Portable Computer To Evaluate Students' Performance



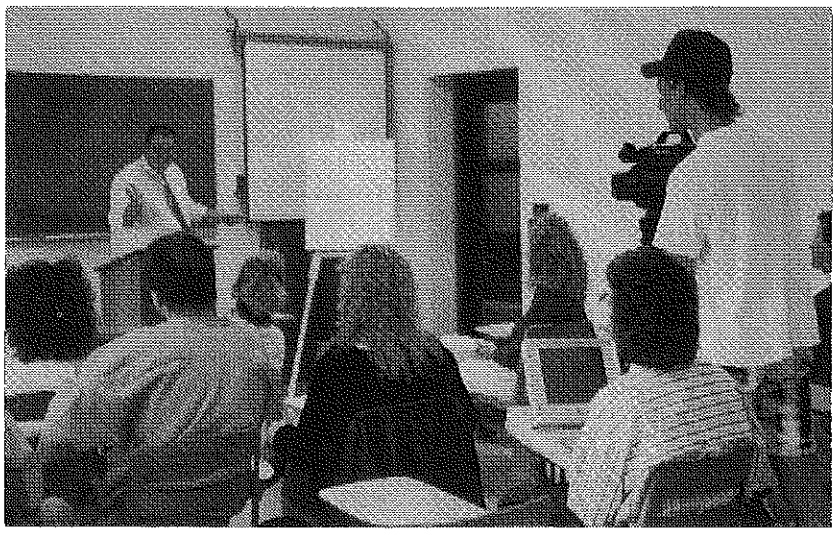
By ROSEMARIE ROSSETTI

Dr. Rossetti is an Assistant Professor of agicultural education at The Ohio State University.

Udergraduates enrolled in the Oral Expression course at The Ohio State University are curious as to what is in the backpack that their professor, Rosemarie Rossetti, carried with her to class. As the gray cloth bag is opened, eyes start to focus on a portable laptop computer that is carefully removed.

This computer is special. The Zenith model ZA-180-65 laptop computer houses a software program that has been adpated and custom programmed to enable the instructor and the teaching assistant to evaluate student speeches. Each student prepares four presentations for their undergraduate oral expression course. The program utilizes an extensive bank of about 150 instructor comments and includes space for 125 characters in order to type in open-ended comments. It provides an evaluation screen to use while observing each of four student speeches. The program can be expanded for additional speeches.

Instructor comments are meant to give prescriptive advice to the students to improve their presentation and speech writing skills. These comments are cataloged by various subject headings such as stage presence, voice, visuals, organization, power of expression, and knowledge of subject. Each comment has an identification code. The evaluator simply types in the three digit code that corresponds to the full comment. For example, if the evaluator wishes to comment that the visual aids used were too small to read, "A11" would be selected on the keyboard. The code "A" contains various comments related to visuals. "A11" tells the computer to choose the 11th visual code to appear on the screen. When the student's evaluation record is printed, the full comment appears. Each student's record is displayed on the computer screen while the speech is in progress. There are spaces available to enter up to 30 codes that correspond to the evaluator's comments.



Students' speeches are evaluated and videotaped as they are given. The portable laptop computer serves as the evaluation tool.

How It Works

The evaluator sits at the keyboard while observing the students delivering their speeches. A master list of the code descriptions is printed out for the evaluator as a reference. These descriptions include comments of positive feedback as well as constructive criticism. Each member of the class has an identification number that is entered into the program. As the first speaker is introduced, that student's record is produced on the computer screen. As the speaker begins talking, the time is recorded by striking one key that activates an automatic time clock built into the computer. Another single keystroke will bring the current date on the screen. The evaluation phase continues as additional codes are selected that correspond with the evaluator's comments regarding the student's performance. At the conclusion of the speech, the computer's time clock is stopped and the computer determines the exact time length of the speech. The evaluator keys in the student's grade, which is automatically logged on the student's record. The next speaker's identification number is keyed in and a separate evaluation screen appears. ➡

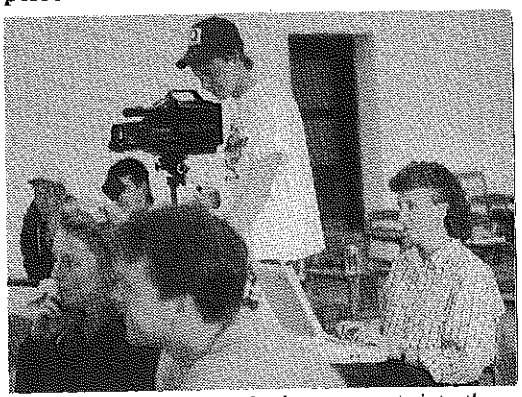
At the conclusion of the class period, the laptop computer is connected to a printer in order to get a printed copy of the evaluator's comments and final grade. The printed copy is given to the student during the next class meeting. Many students find that this form of evaluation is more objective than a handwritten evaluation. Since the evaluation is typed and was produced from a computer program, many feel that it may also be more valid.

Before they deliver a speech presentation, students are made aware of what the evaluator will be looking for in the presentation.

The instructor can modify the program to statistically analyze the data collected. Frequencies for each code description can be calculated. In this manner, the instructor will have information concerning those codes that are most frequently used when students' speeches are evaluated. An additional feature is the automatic grade book which records grades for all speeches and computes a total score.

Benefits of the Program

This is a more efficient method for providing students feedback on their speeches than handwritten evaluations. Student evaluation, logistically, is easier for the evaluator to perform. A greater amount of feedback can be given simply by striking a few keys on the computer. Full sentences are generated on the students' printouts in seconds, making for a more efficient system, compared with a handwritten analysis. Typewritten evaluations are easier to read than are handwritten evaluations. Likewise, there is more consistency between raters. Each rater views the students' performance and evaluates the presentation according to set criteria. The codes, which are part of the system, serve to focus the evaluator's comments. Before they deliver a speech, students are made aware of what the evaluator will be looking for in the presentation. Codes and comments can be shared with the class early in the quarter. As the course develops, additional codes can be added at any time. Existing codes can be rearranged or deleted.



The teaching assistant codes her comments into the laptop computer. A printed copy is provided to the students the next day. The videotape serves as a record of the students' performance. Students can refer to the computer printout while evaluating their tape.

Introduction

Very dynamic opening - pulled audience in well!	P15
Start by looking at your audience!	O22
Greet your audience	O23
Excellent introduction	O7
Strive to make introduction more interesting	O9
Evidence of purpose apparent in intro.	K10

Conclusion

Very nice conclusion -- left audience remembering	O8
Conclusion should leave audience remembering	O10
Speech just died at the end	O11
"In conclusion" a definite ending	O21
Summary was not definite and was ineffective	O25

Figure 1: Sample evaluation codes and comments.

Other Applications for the Program

High school teachers could utilize the program as is or make adaptations for their use when evaluating students giving oral presentations. This could be useful for individual speeches as well as group presentations. There are many occasions when students' oral communication skills are evaluated in the high school classroom. Examples include preparation for public speaking contests, parliamentary procedure contests, and oral reports.

University and college teacher educators could adapt this program for use in evaluating students in microteaching, student teaching and first year teaching programs. Because the laptop computer is portable and contains a battery pack, it can be taken into the classroom at the university, high school or out in a field setting. Specific components of evaluation could be added in order to target the observation. For example, if the evaluator were interested in the teacher's ability to lead student discussion, a specific section related to teaching methods would be highlighted.

Students could take advantage of this computer program when they evaluate their own presentation by way of viewing their videotaped performances. Student teachers or beginning teachers, as well as students in a public speaking class, can take advantage of self evaluations. ➡

Students could also conduct peer evaluations using the computer.

Youth organizations like the FFA, 4-H and the National Junior Horticulture Association could adapt this program for national, state, district and local level competitions. Each of these organizations has speaking contests that would adapt well to this program. Judging for these events would be more focused and directed.

Conclusion

The program is in an early stage of development. It has been field tested at OSU for two quarters. Students have responded positively to the feedback they receive. Currently the program is being expanded to include additional comments. Other speech and education instructors at the university will soon be contacted to evaluate the program. ■

Look for some ways to improve your laboratory teaching in the April issue.

Landscaping . . .

(continued from page 7)

for use in landscape design. Different views of a home can be created in 3-D and then imported into drawing/painting programs. Once the home is in the drawing/painting program, plants can be added to create interesting perspective views. Perspective views created with 3-D programs can project the front, back or side view of the home. These views can be at eye level or from another vantage point. These views offer completely different ways to look at landscape design. Perspective views can also be created using drawing/painting programs. Perspective views greatly add to the presentation of landscape designs since the client can visualize the finished landscape.

Teaching Landscaping Principles

The use of computers does not eliminate the need to teach basic landscaping principles. A good knowledge of the principles of landscape design is the foundation needed to create quality landscapes. Hand drawing skills should be introduced to the students before they are taught computer design. Students will frequently find themselves in situations where hand drawing skills are needed to quickly sketch ideas. Many times designers need to sketch designs on site, where computers are not usually available, although lighter weight laptop computers are becoming more popular.

Hardware Requirements

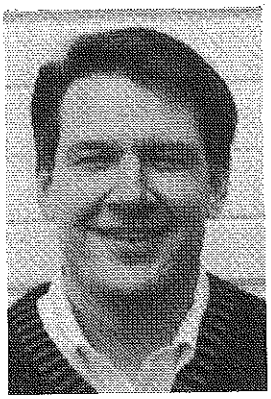
When selecting a computer system to use with landscape design, a high quality, graphics capable computer should be selected. Computers that will become obsolete quickly should be avoided. Graphics programs require a large amount of memory to operate. This will probably require from one to eight megabytes of RAM. Review drawing/painting software for hardware system requirements. Usually a 3.5 inch disk drive and a hard drive would be beneficial. A laser printer is also desirable to produce high quality drawings. One laser printer can easily support the printing needs of several computers.

Instructors may find the cost prohibitive to purchase several computers. This may be solved by rotating students on a graphics computer or by having students work in pairs. Having students work together will improve their ability to work with others and will aid them with landscape design problems and computer problems that they may encounter.

Summary

Technology is moving quickly, and educators must stay current to prepare students to work in the fast-changing landscape industry. With the use of computer drawing/painting programs, students can become skilled at computer landscape design and have marketable skills for the 21st century. ■

Homemade Aquaculture



By MICHAEL WALSH

Mr. Walsh is the agriculture teacher at Genoa-Kingston High School, Genoa, Illinois.

"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, . . . it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us." Those were the words written by Charles Dickens in *A Tale of Two Cities,* in the mid-1800s. Although the words were written over 150 years ago, never have they applied better to a set of circumstances than they did last year as our school's agriculture department took on the tremendous task of putting an intensive aquaculture program into existence.

It Was The Best Of Times

Here in Illinois, and in other locations around the country, we are fortunate to have a company that develops, tests, markets, manufactures, and sells complete aquaculture "packages" for the beginning or experienced aquaculturist. If a person chose to, he or she could write a check and in a matter of days a complete aquaculture system, ranging from tanks to filters and everything else one would need to raise fish, would be delivered at the doorstep. This is one way of starting an aquaculture program. However, for our situation, my students and I came to a consensus that we would like to plan, design, and construct an indoor, intensive aquaculture program from the ground up, and that's where our story begins.

In July 1990, the IAVAT (Illinois Association of Vocational Agriculture Teachers) and FCAE (Facilitating Coordination in Agricultural Education) organizations held inservice programs for agriculture teachers in Illinois. Over a three-day period approximately ten different inservice sessions were held. One of these sessions was on aquaculture. Held at Illinois State University, participants had the opportunity to tour the new aquaculture facilities, be introduced to general aquaculture practices, and do some very basic lab work. This was my first contact with aquaculture. Before this workshop I had never heard of tilapia. Looking for new ways to spark interest in my agriculture program at home, I was very excited and motivated to possibly introduce aquaculture into the agriculture curriculum.

After doing some additional reading on the subject, making some calls to people in the aquaculture business (both amateur and professional), and speaking with our high school biology teacher, I was now interested enough that I asked some key agriculture students if they might be interested in this project and if we should pursue it. Their answer was an excited and enthusiastic, "Yes, let's start an aquaculture program."

It Was The Worst Of Times

In September 1990, the planning stages began. It was a joint effort between agriculture and biology. We soon began to see philosphical and basic planning and design conflicts between the two academic areas. Biology was represented only by one teacher, no students, and no financial backing. Agriculture was represented by one teacher, approximately 12 students, and so far had been responsible for approximately $7,000 in financial support.

The decision to construct an aquaculture system from the ground up, for us, was a good one.

The agriculture students/FFA chapter were providing 100% of the labor and 100% of the financial support, and so the frustrations began to set in quickly. Biology had certain "demands" as far as design, equipment, and set up, although they were not available or able to implement them. On the other hand, agriculture had ideas on design, equipment and set up that they were able to implement with their own time and labor. As money began to become tight, it was agriculture that went out, made the calls, and solicited the over $4,000 worth of donations. A stressful and frustrating situation was developing between the two factions. ➡

It Was The Spring of Hope It Was The Winter Of Despair

In October 1990, the agriculture department filed an application for a $1,590 grant for this aquaculture program with the FCAE organization. The grant money was received in November and work could finally and officially begin. Our FFA chapter was committed enough to this project that they decided to go ahead with it even without the grant money.

The location of the aquaculture lab was first planned for the school greenhouse. When it was realized that more plant dollars would be lost than fish dollars gained, the lab location was moved to the mechanics laboratory. After much discussion, the southwest corner of the mechanics lab was selected as the permanent site for the aquaculture lab.

We Had Everything Before Us We Had Nothing Before Us

Our FFA members contacted Farm and Fleet in Janesville, Wisconsin, regarding the possibility of donating a 500 gallon sprayer tank that could be used for raising fish. After about a three-week wait, I received a call from executives at the Farm and Fleet corporate offices. They indicated that they would like to donate a 1,850 gallon sprayer tank, with slight damage on the top, and two slightly damaged 500 gallon sprayer tanks. We were extremely pleased with this generous offer and accepted quickly. Within a week we had the tanks sitting in our lab. The 1850 gallon tank dictated the size of our project. We had been planning to raise fish in a 500 gallon "aquarium"; instead, we ended up with a 1,850 gallon facility.

Besides these tanks, a former dairy farmer donated a 205 gallon, stainless steel, milk bulk tank. Another local person donated a 200 gallon sprayer tank, and yet another farmer donated two 50-gallon stainless steel tanks. Within a matter of a month we went from having no tanks to having tanks which would exceed the capacity of 3,300 gallons. We seemed to be on our way at last.

To help with the mechanical and construction aspects of this project, we brought in our school maintenance team first as advisors, and later for advanced electrical and plumbing needs. Without their help and cooperation, the project could not have been successfully completed. After much discussion and trial and error, we placed the seven tanks in a variety of configurations. We were trying to find out what floor plan or layout would give us maximum use of floor space and ease of movement by people once inside the lab. After coming to a consensus among our agriculture group on the layout of tanks, the planning and design began on the construction of a room around these tanks which would serve as the aquaculture lab. A totally enclosed room which completely surrounded the tanks was needed for security and to provide a vapor and fume-free environment for fish production.

A room was built that was 20 feet long, 12 feet wide, and 12 feet high. It was designed and built with a fully removable main floor, which was located approximately 3 feet about the concrete lab floor. This raised main floor was necessary because of the 7 foot depth of the main tank. (This allowed visitors to be able to see over and into the tank.) The room also had a full "basement" under the main floor. This area is used somewhat for storage, but mainly it houses the pumps, equipment, and vast amounts of plumbing and accessories needed to run this project.

Approximately 4 feet above the main floor comprise an upper deck that is 20 feet long and 3 feet wide. It houses 2 tanks that are used as "water towers." The deck is used as storage, providing a writing and working surface for students. The room was built entirely from donations. The FFA members and maintenance team constructed the room, which is heavily insulated for heat retention and soundproofed from lab noise.

A used swimming pool sand filter was purchased from a local resident. This was our plan for filtration. In addition, the biofilter is used to help break down the ammonia into a non-toxic form that is safe for the fish. A 220-volt water heater was purchased and installed from an aquaculture industry firm.

After trying several unsuccessful methods of water aeration, we elected to inject pure oxygen into the system. The problem with aeration was that in order to force air to the bottom of our deep tank, the motor required was beyond our budget. A simple PVC device was constructed that mixes the water with pure oxygen and compresses it so that it enters the fish tank as dissolved oxygen.

In March 1991, we began running the system. For the first month we ran the system with water only, no fish. We were

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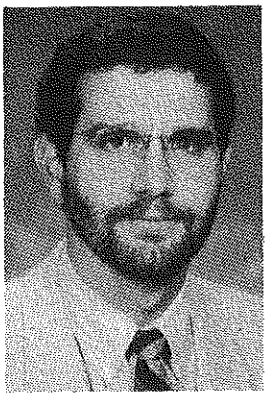
Improving Your Classroom Teaching: Borrowing From TV's Successful Formula



By GARY STRAQUADINE

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You have gone home at the end of a tough day and still have much to do. But you need a break, and it's about time for your favorite TV show. As you sit back to relax, you find that you have unfortunately not missed the preamble of commercials at the start of the show. Then, with exciting colors and a penetrating musical theme, you are propelled through seconds of tension-producing, emotionally stimulating previews of this week's adventures. You almost surrender as you sit back and enter an imaginary world where problems and resolution are completed in less than 60 minutes.

Let's face it, as teachers of agriculture in the United States, we have to do our best to attract and capture our student's time and interest in the classroom. Aside from the other curricular activities in the school, our students are also invoved in jobs, community events, and social interactions. Yet, pehaps one of the most subtle and persuasive forces acting upon the students in our agriculture courses is the successful formula used in television.

The nearly uniform packaging format of television has an influence on the way we present information in our classrooms. Even the occasional TV viewer is familiar with this format. Previewing strategies attract your attention to the upcoming drama, excitement or humor. Transitions built around commercial breaks keep you tuned in. Mystery, more excitement, and even a little romance help build to climactic conclusions. And all of this will occur by the sweeping minute hand on the clock. It is no accident that TV uses this formula. It was used by radio for years. Television producers carefully plan, prepare, and direct their shows using audiovisual techniques designed to get the viewers involved in the show, keep them fixed on their sets, and satisfy their needs for having participated in the experience.

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Teachers of agriculture need to understand how effective these techniques can be when skillfully employed in the classroom setting. Educators have developed elaborate methods for analyzing teaching techniques and their underlying concepts. However, while Bierly and others (1974) identified 25 lesson presentation skills considered part of the classroom teaching process, four skills or techniques are most frequently cited. These four are best summarized as:

1. introducing the lesson, or set induction
2. retaining student attention throughout the lesson, or stimulus variation
3. explaining, and
4. providing reinforcement through planned, summary procedures, or closure.

How could these four techniques relate to watching television? Let's begin with introducing the lesson. Thinking back to the opening description of a successful show, we see this occur by gaining the viewer's attention as that week's preview is presented. The attention-getting techniques must provide a level of interest and intrigue needed to motivate the viewer to continue watching.

To borrow from such a technique, a teacher should be using some kind of special activity which preconditions the learner. Teachers of agriculture must address a diverse curriculum. Each unit of instruction within the curriculum has its own unique qualities that can be used to gain attention and motivate the student to stay tuned-in. For example, in teaching about proper livestock nutrition, why not "entertain" students with an analogy to the human diet, specifically to the consumption of junkfood or empy calories. In addition, the use of appropriate, interest-centered introductions can have great ➡

benefit throughout the unit of instruction. Teachers can use the introduction throughout the lesson to demonstrate a procedure or apply a rule.

You can compare the techniques used to maintain a high level of audience attention in a TV production with teachers' efforts to vary their physical or verbal behavior during classroom teaching. Gage and Berliner (1975) cited numerous studies that suggested that as teachers skillfully vary their physical and verbal behavior in the classroom, students learn more. Your own experiences probably confirm that the teacher who drones on and on in the same monotonous tone will have a dulling effect on most students. Therefore, even agriculture teachers need to be aware of their presentation style.

It is easy to rationalize the use of lecture to provide the greatest amount of information in the shortest period. Yet, this efficiency-based model often lacks effectiveness. The result is curriculum length without depth. Not only do teachers lose students' attention as their minds wander, they miss the opportunity to define the problem and formulate and test hypotheses. Application-based, problem-centered instruction in agriculture requires more than just lecture. Vary your delivery methods in the classroom to enhance the learning environment. Use brainstorming for introducing a unit of instruction. Try supervised study or cooperative learning for the wholesale presentation of cognitive information. Field trips and resource people can help bring closure to those units of instruction that relate to a community issue.

Each unit of instruction within the curriculum has its own unique qualities that can be used to gain attention and motivate the student to stay tuned-in.

In comparing your classroom presentation techniques to the viewing of evening TV, don't overlook commercials. Smooth-talking sales pitches must have a level of clarity that all audiences can understand. This requires clear explanations and examples. Skillful teachers of agriculture will use a similar technique in presenting classroom materials. By drawing upon current agricultural problems and solutions, teachers can better explain materials and concepts that lack clarity. In addition, student examples and community needs should be used often in customizing clarity.

A final analogy can be drawn between evening TV and another classroom teaching technique. Consider the satisfaction of the TV viewer when the mystery is solved or adventure completed at the tidy conclusion of one hour. You certainly don't discount the orderliness of such neat and complete presentations, nor do your students.

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As classroom teachers, we all realize the importance of bringing closure to our presentations.Do you roll through your classroom presentation unit until the end of class is signaled by the bell or students rustling notebooks? Or do you tailor your presentations with a defined opening, body, and conclusion within the limits of the scheduled period? As agriculture teachers we must provide structured learning with logical patterns of lesson introduction, presentation, and summation.

Classroom teachers can learn a lot more from watching television than first believed. By analyzing the presentation formula that television producers have found successful, teachers can become more effective. Applying the concept of set induction or lesson introduction will ready your students for learning. By varying your teaching technique and making the effort to clearly explain materials and concepts, your students will begin to inquire at a greater level. Finally, through closure your students can see the logical conclusion to each unit of instruction.

References

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FEATURE COLUMN

Who's Job Is It?

By JAY RUNNER

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Marketing experts have long been concerned with the image of their products and companies. Much of the research that has been done on the nature of our image has assessed the subjective knowledge of the individual — what a person believes about something and how a person behaves toward an object. An image is like an attitude, opinion, belief, or perception. Marketers are always concerned about messages they send and the ultimate effect upon an image.

As agriculture teachers, we too, are marketers who must be concerned about the image and message we send to the public. Your agriculture program may be enhanced by promoting its value and benefits to students, parents, counselors, administration, and the community.

Teaching without an organized marketing plan could be compared to a business without advertising. It is like winking at someone in the dark. You know what you are doing, but nobody else does.

As educators, it is our responsibility to promote our programs. Ask yourself these five questions. Do parents in your community know about the quality of education and job training your program has to offer? Are administrators and guidance counselors aware of the objectives of your agriculture program? Are local school board members informed about the purposes and roles your program plays in training youth for future jobs? Are students aware of potential jobs available to them following completion of a high school or college education? Are employers in your community asking for any of your students? If the answer to any of these questions is no, you could probably improve your marketing plan.

Listed below are a few ideas that I have gleaned from teachers during my visits as an Agricultural Education Field Advisor in Illinois. These suggestions have been successful for teachers in promoting their agriculture programs and in increasing enthusiasm and interest in agriculture.

1. Always be positive and enthusiastic about your program and classes - it's contagious.
2. Bring in former students who have been successful to use as role models in recruiting new students.
3. Publicize your program through the local radio and media by use of an organized media plan. Develop a calendar of activities at the beginning of the year for events and activities to promote.
4. Prepare a slide presentation to show to junior high students or at your local banquet.
5. Have a "Student of the Month" or "Agriculture Honor Roll" program.
6. Develop yearly themes — "Check Us Out - We Can Offer Alternatives" and use in your promotional campaigns.
7. Develop flyers or brochures about your program for school functions.
8. Write letters to new students welcoming them into your program.
9. Recognize your students and their parents when they do excellent achievements.
10. Conduct your classes in a professional manner, and always promote a professional image.
11. Assist students in counseling procedures when enrolling for class. Develop a four-year plan with them as freshmen.
12. Prepare an annual report to be presented to the board of education at the end of the year. This report should summarize the year's accomplishments and future goals.
13. Have a well organized advisory council or alumni chapter.
14. Have course descriptions and course outlines on file to distribute to parents and students during conference visits.
15. Buy a page in the yearbook and promote your FFA activities and accomplishments. ➡

Homemade Aquaculture

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trying to find out whether we had any "surprises" that needed to be worked out. Aside from an occasional adjustment, this homemade system seemed to be working out fine.

In April 1991, we stocked the tank with 100 goldfish from the local pet shop. The goldfish were the real test to see if we had any problems with mechanics or water quality. Everything still was running fine.

In May 1991, the press and the public were invited to attend the Aquaculture Open House. Student tour guides conducted tours of the new facilities and answered questions; several restaurant representatives showed interest in the finished product for their menus. All of the donors to the project, school officials, all local media outlets, and the general public were invited to attend.

From design to construction and operation decisions, the problem-solving learning that took place was immense.

The system ran with the goldfish with no real problems until September 1991. During September and October the goldfish were moved to a holding tank in the lab to make room for 750 newly acquired tilapia fish.

According to experts in the field, we can expect our first harvest within six to nine months; that would be sometime between March and June of 1992. From each fish we are told to expect two 4-5 ounce fillets, selling for $4.50 to $8.50 per pound. These are rough estimates from people who have been raising fish for years. At the present time we are only equipped to sell whole fish and not filleted or processed in any way.

It has been over a year since the planning began on this project. There is so much knowledge and information to be learned on this subject it is mind-boggling. The decision to construct an aquaculture system from the ground up, for us, was a good one. From design to construction and operation decisions, the problem-solving learning that took place was immense.

Throughout this project we have experienced the best of times when things work, and the worst of times when things that we think should work do not. At the start of this endeavor, we had nothing ahead of us, but by the end of the planning stages, we had everything ahead of us. The quote by Charles Dickens has fit into this situation as if he wrote it exclusively for us.

The FFA motto "Learning To Do, Doing To Learn, Earning To Live, Living To Serve," has really rung true here in a small rural community high school agriculture program in northern Illinois. ■

Marketing . . .

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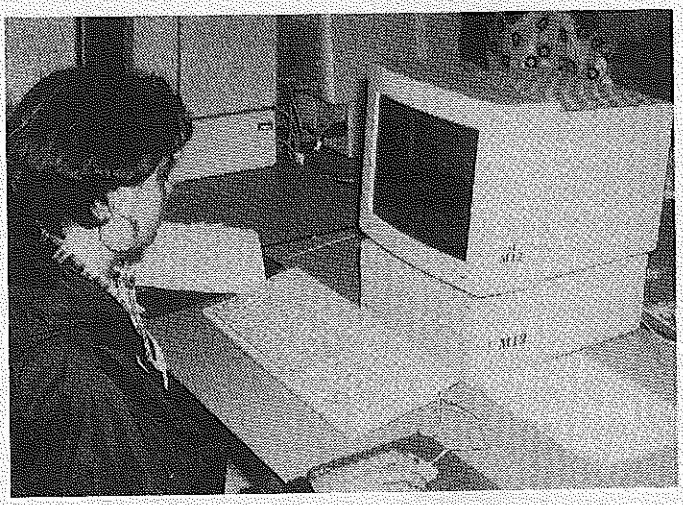
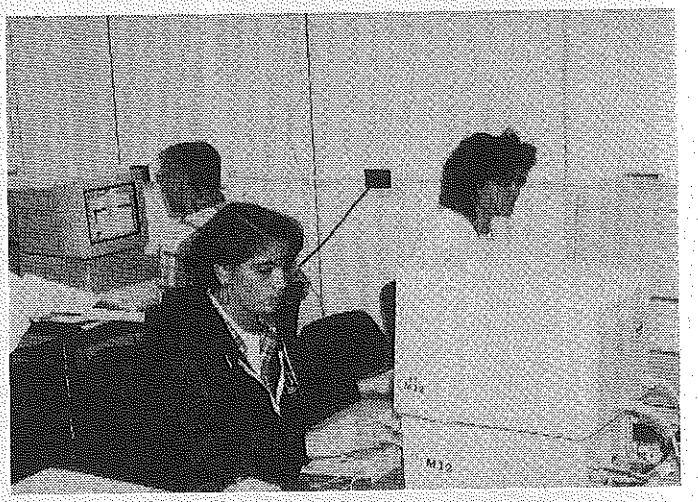
16. Make a presentation to the administration and faculty on the new direction in which agricultural education is headed and the career potential for your students.
17. Make available to local banks, professional offices, etc., fact sheets and career brochures on agriculture jobs.
18. Conduct personal interviews with potential students and parents.
19. Invite local business leaders and key individuals to your annual banquet.
20. Clean house - dispose of all broken or worn out equipment.

So who's job is it? There were four people named Everybody, Somebody, Anybody and Nobody. There was an important job to be done and Everybody was sure Somebody would do it. Anybody could have done it, but Nobody did it. Somebody got angry about that, because it was Everybody's job. Everybody thought Anybody could do it, but Nobody realized that Everybody would not do it. It ended up that Everybody blamed Somebody when Nobody did what Anybody could have done.

If I could use the words of Bernie Staller, Chief Operations Officer of the National FFA, "agricultural education needs your leadership now, for we are heading into great change . . . revolutionary change. And no one can know what's needed in your school, department, or state better than you. Ultimately it's up to you." ■





Students create landscape designs using drawing/painting programs on personal computers. All computers in the laboratory are connected to two laser printers. Below is a sample of the type of landscape designs that can be produced with computer-assisted design courseware. (Photos and illustration courtesy of Clark Harris, University of Missouri.)