The
Agricultural Education
Magazine

April, 1985
Volume 57
Number 10

THEME: Using Microcomputers in Agricultural Education

THE
AGRICULTURAL EDUCATION
MAGAZINE

April, 1985 Volume 57 Number 10

Table of Contents

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 an article unless one is on file with the Editor.

PUBLICATION INFORMATION

THE AGRICULTURAL EDUCATION MAGAZINE (ISSN 0002-144x) is the monthly professional journal of agricultural education. The journal is published by THE AGRICULTURAL EDUCATION MAGAZINE, INC., and is printed at M & D Printing Co., 616 Second Street, Henry, IL 61537.

Second-class postage paid at Henry, IL 61537.

POSTMASTERS: Send Form 3579 to Glenn A. Anderson, Business Manager, 1803 Rural Point Road, Mechanicsville, Virginia 23111.

SUBSCRIPTIONS

Subscription prices for THE AGRICULTURAL EDUCATION MAGAZINE are $7 per year. Foreign subscriptions are $10 (U.S. Currency) per year for surface mail, and $20 (U.S. Currency) airmail (except Canada). Student subscriptions in groups (one address) are $4 for eight issues. Single copies and back issues less than ten years old are available at $1 each. All back issues are available on microfilm from Xerox University Microfilms, 300 North Zeeb Road, Ann Arbor, MI 48106. In submitting subscriptions, designate new or renewal and address including ZIP code. Send all subscriptions and requests for hardcopy back issues to the Business Manager: Glenn A. Anderson, Business Manager, 1803 Rural Point Road, Mechanicsville, VA 23111. Publication No. 07324677.

EDITOR'S PAGE

Our Agenda

BY LARRY E. MILLER, EDITOR

(Dr. Miller is a Professor in the Department of Agricultural Education at The Ohio State University.)

"The Unfinished Agenda, The Role of Vocational Education in the High School" was released at the 1984 AVA Convention under the aegis of the National Commission on Secondary Vocational Education. The Commission was comprised of a prestigious group of persons who have commendably provided insight into the criticality of vocational education.

This editorial will not recant the content or recommendations made by the commissioners. Every vocational agriculture teacher should procure a copy of the report, however, and carefully study its contents. The report provides a fresh perspective on vocational education and edifies the numerous other reports which seemed to propose a philosophy of "educate the best and forget the rest."

The report proposes a humanistic approach to education that focuses upon the needs of the individual. It proposes no simple solution or narrow-minded plea, but speaks to permitting student access to high quality vocational education programs. The commission is to be commended for its scholarly and thoughtful efforts. They have described the parameters of an educational philosophy that should predominate; the needs of the individuals.

Room to Grow

Agricultural education is a part of vocational education. Yet, we may be, in many respects, as different from our sister vocational programs as vocational education is from the rest of education.

As you study the report and consider the recommendations, consider their implications to practice in vocational agriculture. How can we improve the quality of our programs? Granted, we may be doing some of these things now, and perhaps are unique in certain aspects from our sister vocational programs, but we still have much room for growth and improvement.

We are unique in many ways. We have a program of high quality which has helped innumerable people. We all know, however, that many programs have much room for improvement. Like the adage about the short stave in the barrel, we may not measure our quality line above the capacity of our shortest stave. The profession may be described by its shortest stave. Therefore, we must concurrently lengthen that stave as we increase our total volume for high quality. Reports on the quality of education should serve to open a window to new frontiers which will enable us to better serve our clientele. Let us not be reticent to change, but carefully assure that with change we preserve the unique components of our programs which have proven successful.

A Case in Point

This issue aptly illustrates the concern of the profession for high quality programs for our clientele. When it became evident that people needed skill in using microcomputers, teachers of vocational agriculture were trained and they responded by providing the needed education.

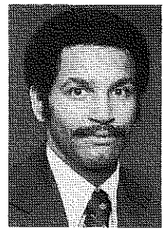
You should benefit by the articles as they provide the viewpoints of some of the persons at the forefront of this endeavor. Our agenda is to continue to provide the best education using the best methods of delivery we can devise.

Correction: The January issue erroneously listed the address of William L. Thuemmel in Maryland. His correct address is Associate Professor and Head, Agricultural Education, 431 Hills House North, University of Massachusetts, Amherst, MA 01003.

The Cover

Barry Hines (Kentucky Winner) and Tammie Miller (Louisiana Winner) acquiring skills during the 1984 National Seminar on Computers in Agriculture. (Photograph courtesy of Dwight Horkheimer, FFA Computers in Agriculture Coordinator.)

A Cut Above Literacy: Using Microcomputers in Agricultural Education



By Blannie E. Bowen, Theme Editor

(Editor's Note: Dr. Bowen is an Associate Professor in the Department of Agricultural and Extension Education at Mississippi State University, P.O. Drawer AV, Mississippi State, Mississippi 39762.)

Microcomputers technology continues to acquire increasingly prominent roles in vocational education in agriculture. The sustained popularity of this technology is the driving force behind this theme, "Using Microcomputers in Agriculture Education." This theme is a follow-up to the January, 1982 issue of The Agriculture Education Magazine which contained a book review and seven articles on the theme of "Computers in Agricultural Education." It would be quite an understatement to say that this technology is still changing the way vocational agriculture teachers are providing instruction to their secondary, post secondary, and adult students.

Practical Problems

When microcomputers were introduced during the late 1970s, teachers were mainly concerned with the notion of "How do I secure one for my program?" After the system had been secured, questions were quite prevalent about how to use the system. Unfortunately, in the rush to stay current, many vocational agriculture teachers were successful in securing microcomputers without the benefit of related inservice training about (1) how to operate the new technology and (2) what tasks and roles should be filled by microcomputers. It is encouraging to see that this situation is being corrected as the profession develops materials and provides the desired inservice activities. These materials and the inservice activities must continue if students in local vocational agriculture programs are to receive maximum benefits from this technology.

The cost of microcomputers and the public demand for computer education are such that no microcomputer should be collecting dust in a distant corner of a vocational agriculture classroom or laboratory. This same expectation is true for classrooms in elementary or high schools, junior or community colleges, and even more so for our universities.

Moving Forward

Several positive steps are being taken to enhance efficient and proper use of microcomputers by the profession. The American Association of Teacher Educators in Agriculture (AATEA) appointed a computer technology committee in 1980 to keep the profession informed about changes that this innovative tool was helping initiate. This committee is still active and has had both direct and indirect input into actions the profession has taken.

Another indicator of how much popularity this technology enjoys can be seen through the "Computers in Agriculture" program that the National FFA Organization started in 1984. Through this program, the outstanding computer-using vocational agriculture student from each state was invited to participate in a seminar and national competition last August in Arlington, Virginia. This writer chaired the judging panel for that competition and it was the consensus of the judges that the students were indeed making excellent applications of computer technology. The computer industry representatives present for the seminar also commented quite frequently about how proficient and creative the students were in applying this technology to vocational agriculture.

A sponsor of the seminar, AgriData Resources, Inc., of Milwaukee, Wisconsin, has further committed its resources to an innovative communications/computing medium termed "The AgEd Network." This Network will tie all vocational agriculture client groups together by computer when it is fully operational.

These actions suggest that agricultural education is moving a cut above the awareness and literacy stages in adopting a microcomputer technology. This issue contains several articles that document how microcomputers are being successfully used not only in vocational agriculture, but in the Cooperative Extension Service as well.

Summary

As the technology is further integrated into local programs, a word of caution is warranted. All efforts should be made to keep vocational agriculture in the forefront without coining new terms to describe our profession. Terms such as "My FFA Computer Teacher" or "My Ag Computer Teacher" are to be avoided. Although this new technology is quite effective and exceedingly popular, it must be kept in perspective.

Microcomputers should be viewed as tools for improving the delivery of vocational-technical education in agriculture. Applications contrary to this mission must be carefully studied because microcomputer uses in agricultural education are now a cut above the awareness and literacy stage.

Using Microcomputers for Instruction and Management

By John T. Giesemann

(Editor's Note: Mr. Giesemann is a Graduate Assistant in the Department of Agricultural and Extension Education at Mississippi State University, Mississippi State, Mississippi 39762.)

So, they finally delivered your computer! You have already decided that your students need to know how to use computers in agriculture. You have probably attended workshops that taught you how to operate the computer, run a few programs, and select hardware and software. Now the most difficult question must be answered. How will you use the computer for instruction and management?

If you have an answer already worked out, congratulations! If not, this article will provide suggestions for possible uses based on ideas collected while teaching high school, college, and adult students how to use computers, and based on numerous articles and books written by agricultural educators and others.

These suggestions will be organized around the roles identified by Dr. Norman Bell of Michigan State University. He said that the computer has three roles in instruction: (1) as the object of instruction, (2) as the medium of instruction, and (3) as the manager of instruction. This article will look at each of these roles in providing vocational agriculture instruction.

Object of Instruction

The computer as object of instruction simply means teaching about the computer. This includes topics such as types of computers available, advantages and disadvantages of using computers, identifying the types of jobs for which computers are best suited, and selecting hardware and software. It would also include the absolutely necessary topics of how the computer works and how to operate it. Instruction of this type is very important to first time users of the computers so they can understand the roles computers can and should play. When these topics are taught, using activities relating to computers or incorporating the computer itself makes the instruction more interesting and concrete.

Some suggested learning activities for teaching the computer as the object of instruction are:

1. Show pictures of early computers such as ENIAC and compare them to the desk top computers of today.
2. Have students compare and contrast a calculator and a computer.
3. Write a short program that calculates and displays 100 addition problems and their answers. Time the students as they perform ten addition problems. Compare the time of the fastest student with that of the computer. Have the students check the accuracy of their work and compare it with the computer.
4. Have students discuss the uses of computers with which they are familiar. Develop reasons for using computers to perform these tasks.
5. Have four pairs of students calculate payment value and total interest on a loan for a piece of agricultural equipment using varied interest rates and lengths of loan using the computer. Write their results on the board and compare them. Discuss the role of the computer in providing information for decision making.
6. Take a field trip to a farm or agribusiness that uses computers extensively. Discuss the uses observed.
7. Discuss computerized equipment such as tractors, spray equipment, and planters.
8. Have an agricultural computing day with several salespeople demonstrating products to all the vocational agriculture classes. Develop question sheets for students which require them to determine uses of the products and discuss these at the next class meeting.

Instruction about the computer should be concentrated on first time users to develop a thorough understanding of its uses and operation. This area of instruction should not be overlooked because a well developed understanding will lead to easier learning during later topics.

Medium of Instruction

The second role of the computer is as the medium of instruction. This means using the computer to provide the instruction or as an aid to instruction. This is probably the most difficult role to implement in vocational agriculture classes for three reasons. One is the lack of equipment. Many vocational agriculture programs have only one computer which makes it difficult to provide instruction to all students. Scheduling problems will arise with only one computer available.

A second reason is software. Software may not be available that teaches the concepts you wish to teach. Software that does teach what you want may be expensive.

The third difficulty lies in the amount of effort required to use the computer as an aid in instruction. Problems, task sheets, learning activity packages, or other suitable activities must be developed. Time may have to be spent developing and refining computer programs.

Even with these problems, computers can be used as a medium of instruction in many ways. The most obvious way is through the use of tutorial programs. Many programs have been developed that teach certain concepts or

(Continued on Page 6)

Using Microcomputers for Instruction and Management

(Continued from Page 5)

skills. Examples are programs that teach how to calculate board feet for a project, how to determine feed rations using the Pearson Square method, or how to read a ruler.

These types of programs can be used in individualized instruction or in group instruction. Slower students or those that have been absent can use these programs to develop their skill without slowing the rest of the class. One suggestion for using tutorials is to divide the class into small groups that rotate among instructional activities. One of these groups should utilize the computer.

Drill and practice programs fit under the computer as medium of instruction role. These programs practice instruction which has already been presented. Examples are quiz programs which can be developed on topics such as the FFA, parliamentary procedure, or breeds of cattle. Programs that practice specific skills such as calculating feed rations, fertilizer application rates, or determining harvest losses are also good examples. These programs can be used individually or in the classroom to reinforce learning. One method that seems to motivate students is to divide the students into groups and let them compete against each other using these quizzes.

Another approach in this role is to utilize the computer to perform operations related to the instruction. After students have learned how to balance a ration by hand, allow them to use the computer program which does the same. Use the computer to reinforce recordkeeping instruction.

Problems can be developed which utilize the computer to perform some tasks. Examples are calculating sprayer calibration settings, determining harvest losses, or developing commodity budgets. These problems are then assigned to various groups in the classroom. As students work at different rates and the problems require computer use at various phases, time on the computer will automatically be scheduled. In the same manner, problems could be assigned to groups and the computer utilized to allow students to check their answers as they finish the problems. Utilizing the computer in this way is the closest resemblance to the actual use of the computer in agriculture.

A fourth use of the computer in this role is in simulation. Simulation is using the computer to determine what the results of taking some action would be. Simulations can be simple or complex. A simple simulation is running the same program on loan calculations several times while varying factors such as interest rates and length of loan. The effect on payment and total interest paid on the loan can be determined and the most economically feasible loan identified.

A more complicated simulation example is a production model. An example is a model developed for a spread sheet package where various factors such as price, calf crop percentage, rate of gain, and other factors have been used in calculations to determine net profit of a beef operation. Changes can be made in these factors and the related calculations will automatically be recalculated and the effect on net profit can be determined.

Recordkeeping is another area where simulations can be used. A farm recordkeeping system can be set up on a month by month basis, the effect on cash flow, income and expense statements or tax statements can be seen.

Simulations have the advantage of allowing students to make decisions and see what the results of those decisions would be without having to pay the penalty for making bad decisions. Simulations represent one of the most advanced uses of the computer in instruction and have tremendous potential for use in vocational agriculture classrooms.

One other area for which the computer has promise is in the agriculture information networks. These networks provide access to a wealth of up-to-date information that can be used in many subject matter areas. This helps make instruction more relevant and interesting as well as demonstrating a source of information which is being used more and more in the field of agriculture.

The following are suggestions for using the computer as the medium of instruction:

1. Determine the areas of instruction for which you can utilize the computer with the software you now have and develop these first.

2. Determine areas of instruction for which the computer could best be used, identify the software needed, and make plans to acquire or develop that software.

3. Make a time schedule for students to use the computer. This works especially well for advanced students. Be sure to block out time for yourself.

4. During agricultural mechanics laboratory instruction, make operating the computer one of the skills to be developed. This works well with freshmen. Other skills such as calculation board feet for a project, determining sprayer calibration rates, or calculation field capacity for machinery could be substituted for advanced students.

5. Assign more experienced students to tutor inexperienced students in a laboratory situation.

6. Use skilled students to develop programs, problem sheets, a special problem, or for extra credit. An example would be developing budgets on an electronic spreadsheet program. Students who have developed programming ability could write short tutorial programs on specific topics. Have FFA officers develop a quiz program on the FFA. Be sure these activities will enhance students' knowledge of agriculture and not simply be a service for you.

7. Assigning two students to the computer at one time seems to be the best arrangement for many purposes. This allows more efficient use of time, slower students to work with faster students, and in many cases, two students are able to solve problems that one student cannot.

Manager of Instruction

The last role is the computer as manager of instruction. This means using the computer to help manage tasks related to instruction. Some examples of these are: developing, storing, printing, administering, or grading tests; keeping track of instructional units/tasks finished by students; keeping records of student grades; storing SOEP records; storing and analyzing records for FFA proficiency awards and State American Farmer Degree applications; maintaining permanent student records; sending letters to parents; and many others.

The computer can be used to manage other tasks related to vocational agriculture programs: maintaining mailing lists and printing mailing labels; filling out frequently used forms; maintaining inventories; and developing and revising budgets for the vocational agriculture program and the FFA chapter. Word processing tasks such as letters, meeting agendas, minutes of FFA chapter meetings, chapter secretary correspondence and chapter histories can all be quickly and easily managed with the computer. Chapter fruit sales can be easily adapted to the computer. The FFA program of activities can be developed, revised, and printed. Newspaper articles can be written, revised, printed, and a mailing label printed in a short time. All of these are tasks which can be done more easily or quickly on the computer. Students can perform many of these tasks and save even more teacher time and effort.

These suggestions relate to the three roles of the computer in instruction which Dr. Norman Bell identified. Some suggestions do not seem to fit any of these categories. Many of these relate to software.

Other Concerns

One question is always asked. What software should I buy? Four types of software that are very useful are electronic spreadsheet, word processing, database management, and authoring programs. These four programs can be adopted to many situations and make the computer a much more flexible tool.

Authoring programs are designed to allow the development of tutorial programs specific to your situation. These programs allow the development of sophisticated lessons with little knowledge of programming.

Other vocational teachers may have developed software which would be usable in your situation. Develop contacts with these teachers and be willing to swap ideas and materials. Form a computer users group and establish a plan for developing software that uses the expertise of each individual. This prevents duplication of effort and leads to higher quality materials in many cases. It may be possible to buy expensive software and use it as a group. Be sure to check copyright regulations before you purchase it, however.

Consult with state staff members, teacher educators, and the Cooperative Extension Service in your state. They have access to many programs, information, and expertise that can be useful in your program. Consult other sources such as magazines, software sourcebooks, and salespeople. Computer users groups can be a very valuable source of software and information. Do not be afraid to ask questions of everyone you meet.

The computer can be a very useful tool in instruction. Hopefully, these suggestions will help you develop uses for the computer that will improve your vocational agriculture program.

THEME

Using Microcomputers to Manage FFA Activities

By Barbara J. Malpiedi

(Editor's Note: Dr. Malpiedi is a Lecturer in the Department of Agricultural Education at The Ohio State University, Columbus, Ohio 43210.)

Is your public speaking contestant almost to tears because that speech will have to be revised and rewritten at least three more times? Are your file cabinets bursting at the seams from an overabundance of information forms and address lists for FFA members and alumni? Or, are you in need of a new method to encourage members to update SOEP records?

If the answer to any of these questions is "yes," then perhaps it is time to consider the applicability of a microcomputer in managing FFA records as well as its capability for assisting teachers and students in other tasks pertinent to the FFA.

Microcomputers are instructional and management tools for the FFA advisor. There may be a need to teach about the FFA, to organize a mailing list, or to correspond with others. In such cases, one may use the conventional modes to get the job done. However, once the capabilities of the microcomputer are discovered, it is rare that any other means will suffice.

One word of caution needs to be issued. The benefits of using microcomputers are not instantaneous or magical. As is the case for the adoption of any new piece of equipment, time is required for learning the system, for converting materials from the filing cabinet to the floppy disk, and for integrating the computer into the established routine. The process is not an impossible one, and the benefits are soon realized.

FFA Computer Instruction

A popular use of computers is computer assisted or aided instruction (CAI). The computer and the software are not intended to replace the instructor, but rather are intended to complement the instruction. For example, following instruction which includes the history of the FFA, the FFA's structural organization, or components of a program of activities; students may review the information using one of the commercially produced FFA quiz packages.

(Continued on Page 8)

Using Microcomputers to Manage FFA Activities

(Continued from Page 7)

Several tutorial packages which focus on parliamentary procedure are also available. For years, students have quizzed each other using books, they have used paper and pencil to complete self-study modules, and now they may use the microcomputer to review parliamentary procedure.

Safety instruction is common to vocational agriculture and the FFA. Tractor safety packages produced by Agri-Quiz and a mechanics program by John Deere have found their way to the classroom. Because of the nature of the packages, they may be used as computer assisted instruction as students review the various areas of tractor safety.

The teacher may elect to use the program to provide a graded quiz for each student. This use of the program, referred to as computer managed instruction, provides students wih randomly selected questions, elicits their responses, indicates if they have answered correctly, and records the score for the teacher. The feasibility of testing students in this manner is questionable although it is done.

Creative Uses for Teacher Utilities Packages

Teacher utilities packages, like the one produced by the Minnesota Education Computing Consortium, assist FFA advisors and members in producing a variety of materials. Utility packages are computer programs which include several different program options all contained on one diskette. The available programs range from quiz writer programs to audio visual development programs. The reporter can use a utilities program to develop posters which announce the next meeting or special events. Banners for displays can be created.

Word searches and crossword puzzles can be produced with several purposes in mind. They may be used to assist advisors in their teaching about the FFA. Members who participate in the Food for America program can easily create agricultural crossword puzzles or word searches for the elementary school children they are visiting.

FFA advisors find the utilities packages helpful as a way to generate quizzes for their contest teams. Once a bank of questions is developed, team members may drill and practice or take several different tests over the material which the questions include.

Utilities packages do not require individuals to be computer programmers. They do permit FFA advisors and members to develop materials relevant to their local needs.

Word Processing and the FFA

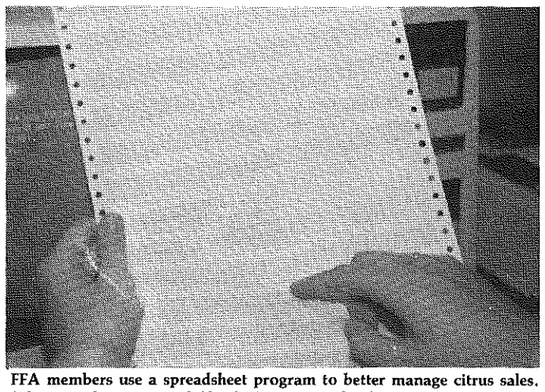
A word processing package is a wise investment for the FFA chapter. Packages which are frequently used in the vocational agriculture departments include: Bank Street Writer, Easy Writer, Apple Writer II, SuperScript, SCRIPTSIT, Word Star, and most recently, Format-II. The particular package selected will depend on the department's computer brand, memory capacity, and, inevitably,the available funds. Many of the clerical tasks which are performed on typewriters can be performed on the computer with word processing packages.

Word processing packages are often used to develop and revise the FFA program of activities. Several of the chapter's activities may remain the same from year-to-year. Rather than retyping the entire document; names, dates, or other items may be deleted from the previous year's document and the revisions typed for the new year. The FFA reporter could use the word processor to write and edit news releases. The secretary could use the word processor to prepare meeting agendas, final copies of the minutes, and other written correspondence. Public speaking contestants would find word processing helpful for revising several drafts of prepared speeches.

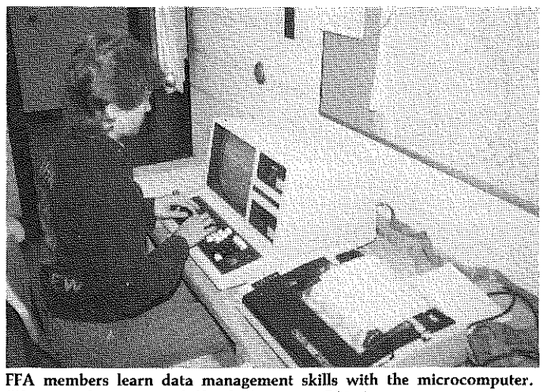
Managing FFA Records

FFA chapters maintain two major categories of data: (1) personal and descriptive information such as names, addresses, and telephone numbers of members and alumni, and (2) accounting information such as student project data, fund raising data, budgets, and inventories. To manage these data, two types of general software packages are available. Personal and descriptive information are nicely organized using a data management package. Accounting, financial records, and many enterprise records are usually maintained on spreadsheet programs.

Camp and Heath (1984) explained a data management program allows the user to maintain and retrieve information that would normally be kept on a form or in a file. Consider for a moment the number of times an FFA advisor distributes cards and asks students to record their name, address, telephone number, type of enterprise, high school activities, class schedule, etc. Data management packages like PFS:FILE, VisiSort, or Profile allow the advisor or FFA member to create a blank form. After saving the blank form on a diskette, it may be used as many times as is necessary.



FFA members use a spreadsheet program to better manage citrus sales. (Photograph courtesy of Chuck Wiseman, Ohio.)



FFA members learn data management skills with the microcomputer. (Photograph courtesy of Chuck Wiseman, Ohio.)

Just as one would enter information for each person on a file card, data can be entered for each person on the computerized form. An example of a form is displayed in Figure 1.

Figure 1. FFA Members Data Management Form

Name:		School:	
Address:		State:	Zip
Phone: ( ) -		School Year: 19	Age:
Parents' Name:			
SOE Enterprise:			
FFA Office Held:		Highest Degree Held:	

It is not necessary to hand sort index cards and write down the names of all students who had a beef enterprise or a lawn service. The computer will sort each form, select the ones requested, print the forms, and summerize the data.

Many of the programs also have the capability to generate mailing labels which can be alphabetized or sorted by zip code. This is particularly convenient for making mass mailings to members and alumni notifying them of summer meetings and special events, or to parents and members of the community inviting them to the local banquet and other functions.

Many FFA chapters are now maintaining computerized mailing lists of their special customers who support the various fund raising projects. Prior to the sale, mailing labels for the preferred customers are printed and post cards sent to these individuals notifying them of the sale. FFA chapters which sell limited quantities of vegetable and bedding plants have found that their customers appreciate the notice.

Spreadsheet applications

To perform accounting procedures with data related to student projects, occupational experience, and other FFA recordkeeping activities; electronic spreadsheets are desirable. The general spreadsheet program results in a grid of rows and columns which can be set up to handle basically any accounting purposes the user desires. Camp and Heath (1984) state that the industry leaders in this area are: VisiCalc, MagiCalc, Lotus 1-2-3, Multiplan, and SuperCalc II (p. 20). It does not require one to spend much more time than a concentrated weekend to learn the commands necessary to effectively operate a spreadsheet program.

General spreadsheet programs permit the user to develop templates pertinent to the local situation. For example, SOEP record books greatly vary from state to state. If the state has not already computerized the record book, the FFA advisor and/or members could develop templates which resemble the accounting pages of the record book. Once the rows and columns are labeled and the appropriate equations set up, a template has been created. After saving the template on a diskette, it can be duplicated for each student's use. Creating the template is a learning experience in itself. As data such as the number of feeder calves, acres of Christmas trees, or dollars earned are entered; the totals are calculated automatically.

Not only is being able to keep good records an essential agricultural occupational skill, keeping high quality records is necessary for those FFA members who expect to earn the FFA degrees and proficiency awards. Creating award application templates and maintaining up-to-date records using spreadsheet programs provide FFA members another opportunity to develop and apply computer skills in addition to the practical application of their accounting skills.

FFA chapters are also using spreadsheet programs for maintaining the chapter budget and for accounting purposes related to various fund raising projects. For example, a record of the chapter's citrus sales project could be maintained with a spreadsheet program. A row is created for each FFA member and the column headings include the member's name, address, number of cases sold per kind of fruit, and the total dollars collected. The citrus sales chairperson could enter new data each day and efficiently update the sales' record.

While commercial accounting packages are available that will permit members to do this, many prefer the flexibility and challenge associated with developing their own templates. It is often less time consuming and less expensive to use the general spreadsheet programs than to adapt those produced by the commercial software industry.

Integrated software applications

Word processing, data management, and spreadsheet software packages are valuable management tools for FFA advisors and members. Each type of software was mentioned separately to facilitate citing application examples. Integrated software packages such as Lotus 1-2-3, Symphony, and Apple Works include a combination of word processing, data management and spreadsheet programs.

The major problem faced by many FFA chapters desiring to use the more sophisticated software is the memory capacity of their computer. Industry representatives recommend that the computer needs a minimum of 128K of memory for the effective use of integrated software.

Most commands used for word processing, data management, and spreadsheets are the same for operations found in all three programs within an integrated package. The integrated package allows the user to access the information stored through one program while using another. The FFA secretary would find it convenient to retrieve budget information from the spreadsheet file while drafting a letter, thus not having to load two separate programs or having to cut and paste from two different printouts.

Computers and the National FFA

The National FFA Organization has made a concentrated effort to promote the use of computers in vocational agriculture. In 1984, students were first recognized by the FFA for their computer activities through the computers in

(Continued on Page 10)

Using Microcomputers to Manage FFA Activities *(Continued from Page 9)*

agriculture awards program. FFA chapters may communicate with the National FFA through the AgEd Network.

The National FFA most recently computerized the American Farmer degree application and is in the process of making the various proficiency award applications software available. FFA advisors and members need to consider what is available through the National FFA and select those options which best benefit their local situations.

Conclusions

Computers are rapidly being purchased for vocational agriculture departments and in many cases, the FFA is the purchasing agent. Also, others who were early adopters of the computer are realizing a need to upgrade their equipment.

Now is the time to ask three important questions: What purposes will be served by the computer? What hardware is required to serve those purposes? What software is required to meet the needs of the department including the needs of FFA, the students, and the teacher? The educational and management purposes of the computer need to remain in perspective as the FFA is only one means through which advisors and members may apply computer skills. Incorporating the use of computers with the FFA represents one means of assisting advisors and students in acquiring computer literacy skills.

References

Camp, W.G. & Heath, B. (1984). Using Microcomputers for SOEP records. The Agricultural Education Magazine. 57 (1) (July). pp. 20-22.

Schmidt, J.B. (1984). Procedures for evaluating microcomputer software used in vocational education. The Journal of Vocational Education Research. 9 (1) (Winter). 10-19.

THEME

Teaching With Agricultural Computer Networks

By Dwight Horkheimer

(Editor's Note: Mr. Horkheimer is Computers in Agriculture Coordinator for the National FFA Center, Alexandria, Virginia 22309.)

Computers have revolutionized the ways information is generated, stored, and transmitted. The ability to search for information is as important as the ability to know information. To seek out information is a computer database takes skills that are not currently a part of the traditional school curriculum.

In 1980, only 21 percent of all high schools owned one or more computers for student use. By the fall of 1983, that figure had risen to 86 percent with some 325,000 computers installed.

Today, state agricultural education supervisors indicate over 60 percent of local high school agriculture departments have one or more computers available for use. By the end of the 1985 school year, they indicate this figure will be over 80 percent.

There is strong evidence that the influx of equipment is outpacing ideas about how to put it to use. No one disputes the need for making children computer literate and able to cope with the rapid technological changes in our world. The questions now revolve around how to do it. Schools will be able to make a successful transition into the electronic information age once they recognize just where they are and what they would like computers to do for them.

Curriculum in the Information Age

If there has been one major gap or weakness in the high school vocational agriculture curriculum, it has been in the area of agricultural marketing and farm business management. Vocational agriculture, for the most part, has placed a greater emphasis upon the instruction of production oriented agriculture. Vocational agriculture has done an excellent job of training students about agriculture as it relates to production tasks in order to measure and increase productivity. However, with more farms having to cope with financial stress, it is imperative that vocational agriculture begins to cultivate the instructional areas of agricultural management and marketing.

After teaching high school vocational agriculture for eight years, I can remember going to the textbook shelves only to find old and outdated materials. Teaching students about agricultural marketing demands keeping abreast of current market prices, trends, and information. It is very easy to find that student motivation declines with the use of old information and materials, whether they relate to marketing or production agriculture. Newspapers, magazines, USDA publications, and the like helped alleviate some of the time barrier. Yet, these sources were not always as thorough or complete as needed.

The alternatives to teaching agricultural marketing and farm management came down to either reducing the amount of time spent on the subject, using outdated information, or acquiring newer, updated materials. Replacement of these books was relatively expensive and became a neverending job. Hence, an electronic form of this information, which can be updated daily, can prove to be a more reliable and valuable source.

Being able to dial-in to an agricultural computer network to access market information placed onto the system the very same day can prove to be a very educational and motivating experience. Farm management skills are not something that can be easily learned from a series of lectures and readings. Vocational agriculture prides itself with exposing students to real life, everyday activities for learning experiences. Remote computers and agricultural databases assist in providing that real life exposure. It will not be long before we will see the computer provide a real life simulation which is more than a simple text, page turning program. This program should combine interactive video, graphics, text, sound, and speech.

In addition to agricultural marketing; farm management, news, information reports, and telecommunications provide for electronic mail communications. Bulletin board systems provide for public posting of information as the name implies. True electronic mail provides for actual delivery of mail and information from one user to another via the computer network. A teacher can type a letter off-line using a word processor, connect into the network, mail the letter, and in a matter of seconds, it is placed into the receiver's mailbox. Or you can mail that same letter to 100 different people all at the same time. No licking of envelopes or stamps required.

The Electronic Universe

Today's online information industry evolved from the remote data processing services that began in the late 1950s as a low-cost alternative to buying or leasing a mainframe computer. On-Line computer services available today include general and topical databases, encyclopedic databases, information utilities, news services, electronic mail and communications, along with computer software uploading/downloading, to name a few.

The 1982 Directory of On-Line Databases listed 919 as commercially available. There were 1,596 databases, marketed by some 220 vendors, listed in the 1983 edition. The directory's publisher, Cuadra Associates, estimates that nearly 2,000 databases were available by the end of 1984. In addition, by 1979 there were less than a dozen computer bulletin boards in the United States. Today, there are more than a thousand.

Granted, computer networks and telecommunications may still be considered in their infancy and they are not free. However, with agricultural profit margins narrowing, the need exists for finding information faster and to obtain and use that information effectively to maximize profits. Educational telecommunications allows you, the teacher, to be an innovator and pioneer like those first users of VisiCalc in the late 1970s who discovered untold power in their new machines. Microcomputer telecommunications is still very strange for most people, including the most experienced computer person.

Computer Networks

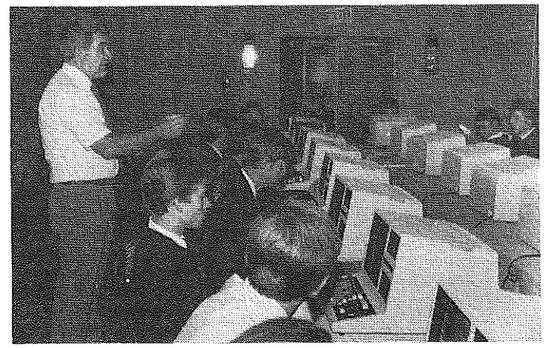
A computer network is actually the linking of a number of remote computers (including mainframes, minis, microcomputers, and dumb terminals or a combination of all four) through telecommunication lines. A computer network can be as small as the connection of a few computers found in a single school or classroom. Or it might consist of thousands of computers located all across the United States or world on individual farms, agribusinesses, and classrooms. The network is formed by connecting the computers through the telecommunications line with special devices called modems. Only through these computer networks do you have the primary means of accessing the available databases and services.

Most any brand or model of microcomputer can be used for telecommunications and linking into a computer network. To expand your microcomputer with the equivalents of speech and hearing, you will need to acquire the following peripherals: a communications card, a modem, a cable to connect the two, a communications software package, and a telephone/telephone line. The total cost for these components can be as low as $300 or as high as $1200 or more. It all depends upon your preferences and your budget.

The most important peripheral, and sometimes the most confusing, is the modem. The modem is the black box that converts the computer's faint electrical signals into sounds that can be sent over telephone lines. Vastly oversimplified, a modem takes digital information from a computer, all those zeroes and ones, and converts it into audible tones. At the other end of the telephone line, the tones are changed back to digital zeroes and ones. Since the device modulated the signal at one end and then undid the modulation at the other, it was called a modem, for modulator-demodulator.

The major distinction among modems is the transmission speeds. Transmission speed is measured in bauds and referred to as baud rate. What is important about baud rate is that there basically are two of them (300 baud and 1200 baud) used in most microcomputer communications, and one of them is four times faster than the other. Some modems can send and receive at just 300 baud, others can do 0 to 300, and some can handle any rate from 0 to 1200 baud. For several years, 300 baud modems were considered the standard. Recently, there has been a strong

(Continued on Page 12)



Bill Michaud, California Polytechnic State University, San Luis Obispo, conducting a workshop for 1984 State FFA Computers in Agriculture winners during the National Seminar on computers in agriculture.

Teaching With Agricultural Computer Networks

(Continued from Page 11)

trend to higher speeds. Many communications networks were originally capable of communicating at only a 300 baud rate. Today, nearly all major networks can communicate at either 300 or 1200 baud with some now expanding to 2400 baud rates.

It must be pointed out that higher speed modems are more expensive to purchase and connect time charges are often slightly higher with faster transmission speeds. On the other hand, however, remember that at higher speeds you can transmit and/or receive information faster thereby reducing your total connect time bill. In addition, when communicating at higher speeds you can reduce the demand for your time to search and obtain the information. Clearly, if the budget can afford it, a 1200 baud modem will prove to be more economical over time.

Agricultural Networks and Databases

A small number of specialized agricultural news and information databases are available for use throughout the United States and Canada. The majority offer current market news and information with the USDA as their major source of information. Others offer some on-line decision aid and agriculture management porgrams.

Four major agricultural information databases are available through various universities: AGNET at the University of Nebraska; TELPLAN at Michigan State University, CMN (Computerized Management Network) at Virginia Polytechnic Institute and State University, and FACTS at Purdue Univeristy.

In addition, less than a dozen commercial agriculture networks are available. Commercial database networks may provide a more extensive collection and variety of agricultural information. Furthermore, they may include information from a number of supplementary agricultural and non-agricultural sources. These include the AP (Associated Press), UPI (United Press International), Doanes Agricultural Reports, regional, and area markets, etc., to name a few.

These agricultural computer networks provide daily market quotes; future market reports; USDA reports and commentaries; local, national and international weather information; research reports; government reports; economists' analysis and recommendations; electronic mail capabilities; and some special on-line problem solving and simulation programs. The type and amount of information will vary with each computer database.

Agricultural networks will generally charge an annual subscription fee along with a connect time fee. For example, AGNET has an annual membership fee of $50, and AgriData $399. This fee includes annual subscription, user manuals, monthly newsletter, and a human-customer services/support number to call if you have problems. Others such as SMN, may charge a monthly minimum ($25) fee.

Connect time rates will vary with an average for most users around $15 to $50 per hour. The average length of time for connecting will range from five to 20 minutes per session. The difference in cost being the type of telecommunications system used. A lower connect time rate may be more expensive since you pay a long distance telephone charge. Others with a higher connect time can be accessed via the Uninet, Telenet, or Tymet communications systems, with only a local or toll free telephone call being made.

Nearly all databases charge a report access fee. This report access fee may be as little as five cents or as much as $5. It varies depending upon the nature of the report, the amount of information, and the source of the information. It does pay to check out all of the variable costs of the network.

Summary

Agricultural computer networks have only scratched the surface of the potential they hold for agricultural education and agriculture as a whole. Agriculture is definitely becoming a part of the information age. Computers and telecommunications are not just another passing fad. The 1983 report by the U.S. Commission on Excellence in Education, A Nation at Risk, identified computer studies as a fifth basic course of study to accompany the traditional core of English, math, science, and social studies.

Vocational agriculture and the FFA have taken a bold step forward by laying the groundwork for the first of its kind, an agricultural education database. Other academic and vocational areas are just beginning to study the possibilities of developing an educational database similar to the Ag Ed Network.

We must remember that the computer is simply an educational tool. Through the use of a computer network, we are able to innovatively expand its use in an educational setting. Everyone entering the computer world becomes a pioneer and charts unplowed ground. Agicultural education will see great advances in telecommunications as we progress through the coming years.

Selected Agriculture and General Databases

AGNET — Agriculture, Home Economics
Source: U.S. Department of Agriculture specialists at several land grant universities.
AGNET, University of Nebraska
Lincoln, NE 68583-0713
phone:402-472-1892
$50 annual membership fee; $30 per on-line connect hour.

CMN — (Computerized Management Network)
Source:
CMN, Plaza I
Building D, Extension Division
Virginia Tech,
Blacksburg, VA 24061
phone: 703-961-5184

TELEPLAN — Agriculture
Source: U.S. Department of Agriculture specialists at several land grant universities.
TELEPLAN, Michigan State University
phone: 517/353-4522

FACTS — Agriculture
Source: U.S. Department of Agriculture specialists at several land grant universities
FACTS, Purdue University
Rm. 210, AGAD Bldg.
West Lafayette, IN 47907
phone: 317/494-8396

AGDATA — Finance and agricultural commodities in Canada.
Source: Alberta Agriculture Economic Services Division
Alberta Agriculture, Economic Services Division
9718 107th St., 3rd floor
Edmonton, Alberta, Canada T5K 2C8
phone: 403/427-5381

AGRICOLA (formerly CAIN) — Agriculture, bibliography of Agriculture
Source: Worldwide journal and monographic literature and U.S. government reports.
Information Systems Division National Agricultural Library
5th floor, U.S. Department of Agriculture
10301 Baltimore Blvd.
Beltsville, MD 20705
phone: 301/344-3813
$35 to $45 per connect hour

AGRICULTURE (AGR) — Agriculture in the U.S.
Source: U.S. Department of Agriculture
Chase Econometrics
150 Monument Road
Bala Cynwyd, PA 19044
phone: 215/667-6600

AGRICULTURE DATA BASE — U.S. Agriculture
Source: U.S. Department of Agriculture statistics that cover agricultural activity at the national and state levels.
Data Resources, Inc.
1750 K Street, N.W., 9th Floor
Washington, D.C. 20006
phone: 202/862-3760

AG ED NETWORK — Agricultural Education
Source: U.S. Department of Agriculture, AgriData Network Information, Vocational Agriculture Teachers, Community Colleges and Universities, Future Farmers of America.
AgriData Resources, Inc.
330 East Kilbourn Avenue
Milwaukee, Wisconsin 53202
phone: 800/558-9044 or 414/278-7676
$224 annual subscription fee
$28.19 on-line (at 300 baud), $39.24 on-line (at 1200 baud)

AGRIDATA NETWORK — Agriculture Industry
Source: U.S. Department of Agriculture, market analysts, economists, researchers in the U.S., and world. Also Commodity News Service, Weather Service International, Top Farmer Intelligence, Doane's and others
AgriData Resources, Inc.
330 East Kilbourn Avenue
Milwaukee, Wisconsin 53202
phone: 800/558-9044 or 414/278-7676
$339 annual subscription fee
$28.19 on-line (300 baud), $39.24 on-line (1200 baud)

AGRI-MARKETS DATA SERVICE — Agriculture
Source: U.S. Department of Agriculture
Capitol Productions, Inc.
1300 N. 17th St., Suite 1500
Arlington, VA 22209
phone: 703/528-1100
$24 on-line (300 baud), $48 on-line (1200 baud)

AGRICULTURAL MARKET NEWS SERVICE — Ag. Market News
Source: USDA
USDA, ASD
14th & Independence Avenue, S.W.
Washington, D.C. 20250
phone 202/447-7047
Dedicated AT&T telephone line

GRASSROOTS — INFOMART — Agriculture Industry
Source: USDA, Market analysts, economists, and researchers in Canada and the U.S., Winnipeg and Mid-America Commodities Exchange, Chicago Board of Trade and Merchantile Exchange
INFOMART, 511-1611 Portage Avenue
Winnipeg, Manitoba, R3J
phone: 304/772-9453

General Databases/Information Utilities

the SOURCE — Americas Information Utility
Readers Digest and Control Data Corporation
Source Telecomputing Corporation
1616 Anderson Road
McLean, VA 22102
phone: 703/734-7500

CompuServe Information Service
5000 Arlington Center Blvd.,
Columbus, Ohio 43220
phone 614/457-8600

Bulletin Boards:

Ag Computing Infoline — 314/569-0532
Doane's Ag Computing
Doane's Publishing
11701 Borman Drive
St. Louis, MO., 63146
Subscription to Doane's Agricultural Computing ($48/yr.)

References

Agricultural Computing Source Book, Doane Western, Inc., St. Louis, MO.

Burnham David. The Rise of the Computer State. New York: Vintage Books, 1984.

Cook, William J. The Joy of Computer Communication. New York: Dell Publishing Co., Inc., 1984.

Glossbrenner, Alfred. The Complete Handbook of Personal Computer Communications. New York: St. Martins Press, 1983.

Glossbrenner, Alfred. "Tricks of the On-Line Trade," PC:IBM, October, 1984. pp. 177-192.

Harris, Mark, "On-Line Network News," PC:IBM, October, 1984. pp. 143-145.

Helliwell, John. "On-Line With Smart Modems & Software," PC:IBM, October, 1984. p. 127-130.

Kransnoff, Barbara. "DataBases: Believe It Or Not," PC:IBM, October, 1984. pp. 127-130.

Lesko, Matthew. The Computer Data and Database/Source Book. New York: Avon Books, 1984.

McDermott, Brian. "The Online Schoolhouse," Link-Up, September, 1984. pp. 16-20.

Moss, Carol M. "The Electronic University," Link-Up, September, 1984. pp. 22-23.

O'Brien, Thomas C. "Wasting New Technology On The Same Old Curriculum," Classroom Computer Learning. November-December, 1983.

Samples, Pat. "Educational Databases: Learning About Learning," Link-Up, September, 1984. pp. 26+.

Schneider, Mary. "Going Online for 'Food of the Soal'," Link-Up, September, 1984. pp. 27-28.

Schneiderman, Martin. "Making the Case for Innovation," Popular Computing: Guide to Computers in Education, October, 1984. pp 88-95.

Shea, Tom. "Future Farmers Go On-Line," Infoworld. May, 1984. pp. 30-31.

Watt, Dan. "Teaching In the Computer Age," Popular Computing, August, 1983, pp. 56-66+.

THEME

Getting Teachers To Adopt and Use Microcomputer Technology

By Dale Ratcliff

(Editor's Note: Mr. Ratcliff is a Vocational Agriculture Instructor at the California R-1 High School, California, Missouri 65018.)

We have seen many changes in agriculture during the last two decades. We have gone from a large tractor of 60 to 70 horsepower to one of over 300 horsepower. We have seen the disappearance of the rural "hand crank, party line" telephone to a push button model that will allow you to converse with someone thousands of miles away almost as if they were in the same room, and you make that connection in a matter of minutes, if not seconds! We have seen astronauts not only walk in space, but also go to the moon, walk on it, and return home safely. We have seen the ability to travel increase dramatically. We are able to gain information concerning events occurring in remote parts of the world in a matter of hours rather than days as well as many other improvements in areas too numerous to mention.

Microcomputer technology as well has evolved dramatically in the last 20 years. The speed at which improvements and new hardware is appearing is almost frightening. Twenty years ago, a computer that contained four kilobytes (K) of Random Access Memory (RAM) might have cost $100,000 or more. Today, we can easily place computers having from 32 to 712 or more of RAM on our desks in virtually any room in a building. These computers cost from $1,000 to $10,000 depending upon the model and its capabilities.

The software and computer programs that are available today have improved dramatically as well. Large and complicated calculations are performed in a matter of seconds rather than hours. Data can be moved from one program to another, to a computer in another room, or even to another city in a matter of minutes.

Apprehensions

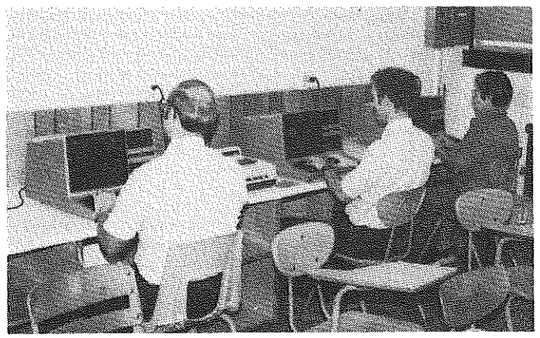
Many vocational agriculture teachers depend upon a very common computer (the calculator) and think nothing of it, but feel fright, anxiety, and numerous other apprehensions when confronted with a desk top computer.

Why is it that this machine has such power over us at first? Young people are not afraid to "give it a try." Children will start playing with it almost at first sight; but, universally adults seem to be afraid of the computer.

I have found that teaching adults to use the computer can be successful only if they are willing to adapt to the new technology. I believe that this is true for vocational agriculture teachers as well as farmers, housekeepers, or business persons.

As with any new item of equipment, teachers have to feel comfortable and confident that they have enough knowledge to use the item. This seems to be one of the major problems with vocational agriculture teachers. Some teachers have students who actually know more about the computer than they do. If this is the case, a special problem then develops. Unless teachers become proficient with the computer or are willing to acknowledge that students may actually know more about the computer, they will have problems using computers until they are able to change their attitudes.

If teachers develop a fairly good working knowledge of a few programs that can be used in their departments, they will be on their way. They will not have to worry about the student who has a computer at home and may know more about it than they do.



Radio Shack TRS-80 Model III & 4 Computers have been used most extensively for teaching purposes; although other brands have also been used.

When more powerful "business type" computers are used in instruction, attempting to set up classes where each person has access to a computer is most beneficial to the learning process.

Since we all learn from experience, the computer should not be any different than any other new experience. Most people do not get too excited when someone tries to teach them a new card game or dance step. If we teach current topics, vocational agriculture teachers must be willing to learn new information almost daily. In agriculture, new information concerning nutrition, genetics, pesticides, machinery, livestock, and many other areas confront us each day. The computer should not provide an unpleasant, experience in our quest to help students.

Types of Users

If we assume that everyone is going to learn to use the computer at some time, we need to look at some differences in people. There seems to be at least three levels of computer users. The first level includes those teachers who are willing to become proficient enough to use a certain group of programs they acquire.

The second level includes teachers who want to make minor changes in BASIC programs or to reconfigure programs to allow different parameters to be created.

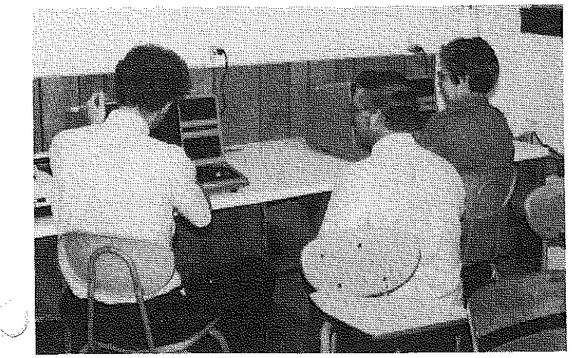
The third level includes teachers who wish to learn as much as their time and ability will allow. Some of these folks may actually write programs or develop usable software using configurable programs such as the Data Base Managers.

Of course, we all start at the first level and then progress upward as our desires and abilities allow. I have found that to get teachers to adopt microcomputer technology certain steps almost invariably must be followed.

Teaching Teachers

First and foremost, is that teachers must be willing to try to change. They must be willing to recognize that microcomputers are machines which do not have minds and cannot hurt the operator.

In a class, after discussing general information such as terminology, how the computer is constructed, and how it operates in general terms, I suggest that everyone get in front of the computer. From there, I give everyone the opportunity to turn the computer on, insert a diskette, and learn some of the various commands that are most often used.



Small groups are almost a necessity when attempting to update teachers. The smaller group allows a single teacher to keep everyone moving along in the learning process more evenly.

After we have gone through that procedure and since practice itself is a good teacher, all computers are turned off and each individual is given the opportunity to get back to the same place without any assistance. This may have to be done several times during the session to allow the development of the confident attitude of "I CAN" rather than "I CAN'T!"

A good confidence developer is to use a spreadsheet program to create a simple activity such as the calculation of one's age in days or the cost of a number of cups of coffee consumed in a day. I have found this helpful because people find that they can do something with the computer. From here I believe that the operators (teachers) should be moved to software that they can find useful in their own situations. This may include additional work with the spreadsheet since it is useful in a variety of applications. I believe that a good word processing program should also be included because about everyone uses a typewriter to some degree. Teachers will also be able to use the word processor for many applications such as creating tests, study guides, information sheets, and many other uses.

These activities help overcome the fear associated with the computer and allow teachers to gain confidence that they "Can Do."

The next step, selecting software (that will fit their own situations), can be a real key to helping teachers become proficient users of microcomputer technology. We advance only as fast as necessary, remembering that our students (teachers) are somewhat like freshman vocational agriculture students; on the one hand they are not sure what is happening and on the other hand some tend to adapt at a slower rate.

If I am using commercial programs, I select ones that are easy to use. They may be programs that either have very good documentation or that show most of the prompts on the computer screen. Hopefully, both of these items will be present in the software package. Unfortunately, most computer hardware manuals are not very well written. Therefore, I like to make a printed list of the commands that are most commonly used and give a copy to each person as we go through the program.

The third phase is the realization that we need to develop the "I Can" attitude. Perhaps this means admitting that we do not know everything and that we can get some help from someone else. New users should try to develop a good working relationship with someone who is a more experienced computer user. They cannot be afraid to ask for help when they have a problem. Most people will be more than willing to help if people will show them a little respect and goodwill in return for their help. Likewise, a teacher cannot be afraid to get help from a student if there is one who is knowledgeable about computers.

Those who wish to advance to the second level, that of learning some programming or learning how to configure some of the more complicated commercial programs, probably need to have additional classes.

I believe that vocational agriculture teachers would be

(Continued on Page 16)

Getting Teachers To Adopt and Use Microcomputer Technology

(Continued from Page 15)

much better off learning how to use some of the better commercial spreadsheet, data base management, word processing, and special purpose programs than taking a complete course on programming. Many of these general programs are so powerful today that they will do many of the applications that required a special BASIC program only a couple of years ago. Also, I do not think that we have seen the end of the new multipurpose program developments.

Summary

Teachers are much different from students when it comes to computers. However, if we remember that no day is lost if we learn something useful, then there is no way that we can keep from developing microcomputer technology skills. Computers are rapidly changing and developing. It will be very hard for everyone to keep up, but as in any other area, there will be teachers who have the desire to stay current.

With everyone working together, we should be able to help our fellow teachers, students, and ourselves develop the skills necessary to successfully compete in the world of tomorrow.

THEME

From Barn Doors to Printouts: Teaching Adults to Use Computers

By Pat Harrington

(Editor's Note: Mr. Harrington is a Professor of Farm Business Management at Central Arizona College, Coolidge, Arizona 85228.)

Grandpa kept his records on the inside of the barn door. Planting rates, drill gear settings, and crop yields were neatly penciled on the unpainted wood. The information was next to his work, with a pencil close for updates and easily accessible when needed. His recordkeeping system fulfilled the business requirements of his day.

Dad uses an updated version of Grandpa's system. A notebook with pencil hangs in the shop available for important figures which will later be transported to the house. At the desk, the notes undergo the scrutiny of pencil and calculator. Dad learned the importance of records and a proven method of keeping information from his father. I am sure that Dad would have reenacted Grandpa's barn door method except that those were "the good old days." Management was simpler than, hence the improvement on a proven system.

The business of farming has become increasingly complex in recent years. Product changes occur daily. New machinery vies for the farmer's dollar. Interest rates constantly fluctuate. Decisions must be made quickly. At the same time, these decisions must be based on a thorough analysis of the information at hand. In order to accomplish this, many farmers see the microcomputer as the machine which they need to master and add to their current farm machinery.

Vocational agriculture has historically met the educational needs of the agriculture community. We are doing it today with microcomputer courses for adult farmers. The program which I coordinate is only one among many opening the computer world to farmers. These programs may vary in methodology, but they all strive to provide farmers with useful knowledge. Most importantly, the participants share a common desire: they want to make a transition from hand-kept records to computerized records; from barn doors to printouts.

Reassuring Adults

Education occurs when useful skills are learned. The transfer of knowledge may be through speaking, demonstrating, or reading. This transfer can only successfully happen when the needs of the students are recognized. Teaching adults to use microcomputers involves an understanding of their fears. Adults experience many fears because of computers: fear of failing; fear of looking a fool in front of others; fear of asking questions; fear of breaking the computer. These fears can give way to learning if microcomputer courses are built on three basics: honesty, self-image, and successes.

An honest exposure combines the enthusiasm of knowing what computers can do with a sharing of the unavoidable: learning can be fun, but it still takes time and "stick-to-itiveness." Once exposed to the potential of a computer, it is all too easy for educators to over-simplify the learning curve. "Piece of cake!" "That's easy!" "You can do that in three minutes and have time to smoke a cigarette!" The first applications done on a computer will require two to three times as many hours more than doing it with pencil and paper. A farm newsletter writer related a story about his grandfather's experience with cars. The grandfather purchased a Model T shortly after it became popular. He bought the weekly groceries before driving his new acquisition home. As he reached over to catch the groceries when crossing a set of railroad tracks, the Model T drove itself into a ditch. The fellow left it there and never bought another car, stating, "No horse would go into a ditch."[1]

How many farmers have purchased computer systems on a salesperson's or a friend's promise of what the machine can do only to have a bad experience which resigned the computer system to collect dust instead of data? Be honest with adults. Tell them that using a computer is not as easy as writing on a barn door. Computers do not think. They handle numbers and information very quickly and efficiently. Computers improve on current recordkeeping systems. Machines cannot make up for work that has never been done by hand!

Encourage Success

Adults often enter a classroom with a feeling of inadequacy. Work with them to build their self-image. The classroom is all too often turf for educators instead of students. One adult summed it up well, saying, "I feel out of place sitting in this classroom." Successful adult computer courses should consist of sharing information which relates to the everyday experiences of the participants. One teacher passes computer micro-chips and expansion boards around the classroom to break the mystique of the computers.

Learning to use computers puts adults at a double disadvantage. It is a machine which most of them did not grow up with, and computers have been the source of new words that strike many as a foreign language. To help an adult feel at home in front of a computer, the educator has to build bridges between barn doors and printouts. The process involves examples and educational experiences which enable the adult participants to make connections between their current manual systems and computer systems.

Computer terms should not be shunned nor avoided. At the same time, courses taught in "computer-eze" may as well be taught in Greek or Latin. Choose and use terms which are essential. Build the vocabulary from class to class. Eventually terms such as "DOS" will become as useful as words like "horsepower."

Finally, the educator needs to capitalize on the successes made by the adult students. Imagine the experience of farmers in the early 1900s learning to plow with tractors. They knew the appearance of a nicely plowed field; stopping and starting horses was second nature. Plow direction and draft could be controlled while looking at the cattle in an adjacent field. Picture then the tense arm and leg muscles that first time on the tractor. Feel the awkwardness and frustration. In spite of it all, tractors replaced horses. Farmers had and continue to have successes using tractors. Setting the stage for successes can make the difference between a smile of accomplishment and the long face of frustration. Whenever possible, have a computer for each participant. When class numbers exceed available computers, institute a regular rotation. It is pretty hard to learn how to milk a cow if you watch from the other side of the fence.

Choose software and examples with "successes" in mind. The use of a simplified crop or livestock budget to introduce an electronic spreadsheet will often be followed by, "I could do this." Once the participants are on the road of "successes," the educator can take a position next to them as a player-coach. A word of caution to the educator: Keep your hands off those keys! How many farmers use typewriters regularly? It is too easy to do it for them. "Successes" involve more than neat printouts. Inserting a diskette into the disk drive, locating the switch, understanding commands, saving files, etc. is a learning-by-doing process, just as the introduction of tractors was such a process.

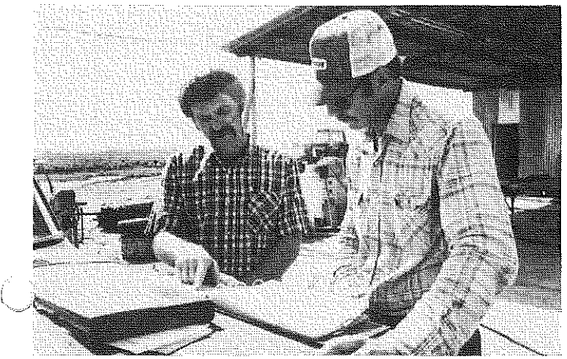
Summary

Teaching adults to use computers necessitates techniques and ideas which go beyond methodologies employed at the secondary, post secondary and college levels. Farm adults seek improved recordkeeping systems and alternative decision making tools. In short, a better barn door. Owning and operating a farm is very different from preparing to enter into farming. Careful preparation of curriculum and courses must be based on this fact.

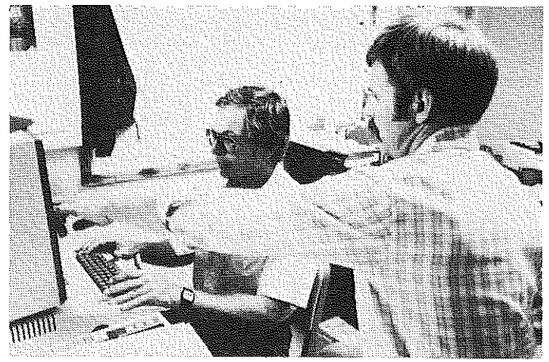
It would be nice to write a formula which would work for all adult farm computer classes. The good news is that barn doors are great for keeping records. The bad news is that there are no two barn doors alike. An educator undertakes the task of facilitating the learning process. Facilitation which provides adults with useful knowledge and personal successes will make the transition from barn doors to printouts possible.

References

[1]Robert B. Harris, "What will you do with your farm computer?", The California Farmer, October 15, 1983.



Computers improve on current recordkeeping systems.



A word of caution to the educators: keep your hands off those keys!

THEME

Working Smarter, Not Harder

Technology is constantly changing, and agricultural educators must stay abreast of these changes in order to be effective in teaching students marketable skills. Microcomputers are firmly entrenched as a vital part of our lives. They have reached from science and business into agriculture and even into education. Vocational agriculture teachers and teacher educators have the opportunity to be leaders in incorporating microcomputer education into existing curricula.

Computers have been used for several years in mathematics classes to perform repetitive calculations and in science classes for graphics demonstrations. A more far-reaching consideration, however, may be the career aspect.

Computer literacy is especially important for students in vocational agriculture porgrams, since computers are used throughout the agricultural sector from small family farms to international agricultural corporations. Computer literacy is important not only for those students seeking vocational careers, but also for those students planning to obtain a college education.

Most agricultural college curricula, regardless of major, include at least one computer course. The student who learned the basics of computer operation in high school will have the advantage of approaching college classes with introductory level computer skills.

Limiting Factors

Several limiting factors exist which hinder the use of microcomputers in vocational agriculture. One major drawback has been the limited availability of microcomputers to vocational agriculture programs. Another problem has been the lack of high quality, applicable software packages which have been available for use in vocational agriculture courses. A third factor has been vocational agriculture teachers' lack of knowledge concerning the use of microcomputers in their classrooms.

By M.J. Cepica and Carl G. Igo

(Editor's Note: Dr. Cepica is Assistant Dean & Director of Academic & Student Affairs, College of Agricultural Sciences, Texas Tech University, Lubbock, Texas 79409; and Mr. Igo is Vocational Agriculture Teacher in Fort Hancock, Texas 79839.)

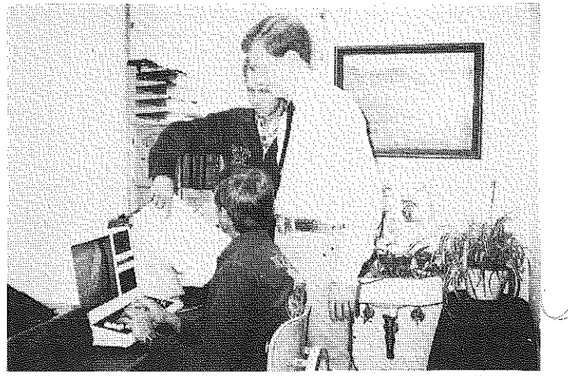
As vocational agriculture teachers begin to accept computers as beneficial instructional aids and begin to request microcomputers for use in their programs, the problem of computer availability should be reduced. However, only when teachers become computer literate and begin assisting in the development of software specially designed for use in vocational agriculture will the problem of limited software availability be overcome.

Modes of Instruction

The success or failure of any Computer Assisted Instruction (CAI) depends primarily upon the instructor. CAI has been categorized into four classifications or modes. Each mode employs a different method students must use to complete a program or problem.

The strategy of the drill and practice mode is to simulate interaction between the student and the teacher in a homework assignment manner. Drill and practice exercises have been used to evaluate a student's comprehension of a specific learning situation resulting from classroom instruction. Although the mode does not formally teach, it does provide a means of measuring the results of instruction performed by the teacher. The drill and practice mode is particularly adaptable to objective type, multiple-choice or true-false questions.

A graduate assistant develops BASIC program for the SOE production agriculture record book for Texas Vocational Agriculture Programs.



Students receive instruction on using a program for SOE recordkeeping.

Another form of individualized study is the tutorial mode. Under this mode, the student actually receives instruction from the computer. The teacher is relieved of instructional tasks and, while acting as the director and troubleshooter for the student, has more opportunity to interact with the students on an interpersonal basis.

The dialogue mode is sometimes called the problem solving mode. A typical program poses a problem to the student, provides relevant data needed to solve the problem, performs calculations, and then evaluates the student's efforts in logically solving the problem. An example of a dialogue mode program is determining the amount of fertilizer needed to realize a rate of diminishing return on a certain crop.

The fourth mode of CAI is the simulation mode. Operating under this mode, the computer replicates a real situation or problem and the student is required to make management decisions to solve the problem. The simulation mode has proven effective in actually teaching students. Vocational agriculture instructors may use the simulation mode to bring into the classroom a situation which could not normally be presented due to time or other restraints.

Educational Roles

Microcomputers may best be used three ways in education. The most common role is the use of the computer as a tutor for the student. This method is especially useful in remedial instruction as subject matter is presented to the student by the computer. The student responds to questions and the computer selects the next question based on the student's response.

Second, the computer may be used as a learning tool. With this method, the computer is used as an instructional aid to make up a part of a teaching unit. Using the computer as a tool, the instructor can better illustrate concepts or ideas beyond the scope of normal classroom instruction.

The third role for computers in education is the role of the tutee. Simply stated, this method is actual programming by the student. The tutee role requires the student to learn a computer language, develop an understanding of the subject matter, and perhaps most important, to think logically.

Of the three ways computers may be used in education, the tool method may be most appropriate for vocational agriculture programs. Using tool programs, the student may solve complex problems without expending time on long mathematical computations. Much of the software available for vocational agriculture includes programs which are tools for recordkeeping and management decision making.

Benefits

It has been predicted that over the next five years farmers will purchase one-half million computers. Those farmers will also be hiring employees with computer knowledge. Many agribusiness firms have integrated the use of microcomputers in their operations, thus requiring computer skills of their employees. The benefits of using microcomputers are widespread.

Especially important to vocational agriculture is that local adaptation may be easily achieved through the use of user produced software. The computer can also increase the rate at which students learn and the knowledge retention of students. Other benefits include the simulation of real-life situations and the time-lapse manner in which long-term events may be studied.

Vocational agriculture teachers in Texas are beginning to use microcomputers in their programs, from production agriculture to cooperative part-time training, pre-employment laboratory, coordinated vocational academic education, and vocational education for the handicapped. However, a larger percentage of teachers are using microcomputers in production agriculture than other phases of the vocational agriculture program. The higher percentage may be attributed to the emphasis on agricultural management. A recent study in Texas indicated that most vocational agriculture teachers who are not currently using microcomputers in their vocational agriculture programs plan to incorporate their use within the next five years. Other states are following a similar trend.

Priorities

Several high priority topics for software development have been identified by Texas vocational agriculture teachers. The most requested topic for software development was the Supervised Occupational Experience production agriculture record book. The second most requested topic involved a software package which would allow vocational agriculture teachers to keep computerized records on their laboratory and classroom inventories. The third most widely requested topic was for parliamentary procedure. Under the area of animal science, software packages dealing with rations and livestock production management were the fourth most requested topics. Development of these and other priority topics has been undertaken by computer programmers working under the direction of professors in the Agricultural Education and Mechanization Department at Texas Tech University.

Vocational agriculture teachers have begun to realize the importance and benefits of using computers in the classroom. Many teachers have requested inservice education topics including short courses in BASIC programming language and workshops concerning available software.

Considerations

Vocational agriculture teachers should consider the following before attempting to implement microcomputers in the vocational agriculture curriculum:

1. Work with your administrator in obtaining microcomputers and printers to be located in your department.
2. If it is not possible to purchase microcomputers to be housed in the vocational agriculture department, obtaining access to computers located within the school system to be used during regular scheduled vocational agriculture classes is imperative.

(Continued on Page 20)

Working Smarter, Not Harder

(Continued from Page 19)

3. Before purchasing microcomputer equipment, be sure it is compatible with existing equipment. Insist on observing the operation before agreeing to purchase separate components.

4. Determine the availability of quality educational software for appropriate vocational agriculture topics and make certain that software is compatible with the computer you are planning to purchase. Available software should be a primary consideration when selecting microcomputer hardware. A critical need still exists for quality software for vocational agriculture programs.

As vocational agriculture teachers learn to program and begin to develop software, they should be willing to share software with colleagues in the profession. Students can then benefit from using software developed specially for vocational agriculture and teachers benefit from not wasting departmental money on expensive software which may not be applicable to the state or agricultural area.

The adoption of any new innovation requires important decisions. Vocational agriculture teachers must have instructional resources available to prepare students with skills necessary to gain entry-level agricultural employment. Those skills are no longer limited to agricultural laborer type skills, but also include basic technological skills. The impact of technology and the need for computer related instruction have been expressed through numerous sources in industry and education. And, computers are exciting! They will not break when you touch them, they are not that difficult to use, and endless possibilities exist for their use. Vocational agriculture teachers have traditionally been leaders in adopting new innovations. Reports indicate the adoption of microcomputers in vocational agriculture will be another asset to the strong program which now exists.

THEME

Microcomputers in Cooperative Extension

". . . to aid in diffusing among the people of the United States useful and practical information on subjects related to agriculture and home economics and to encourage the application of the same."[1] Does this phrase sound familiar? For those who are familiar with Extension, it should. It is the mission statement of the Cooperative Extension Service as set forth in the Smith-Lever Act of 1914.

By Graydon Edward Elliott

(Editor's Note: Mr. Elliott is Acting Leader, Computer Applications and Services Department, Mississippi Cooperative Extension Service, Mississippi State University, Mississippi State, Mississippi 39762.)

Definitions

Dissemination of information to clientele has been Extension's mission since the beginning. Canning clubs for girls and corn clubs for boys were early examples of Extension's grassroots approach to disseminating vital information. In recent years, a new term has been coined which describes the link between knowledge generators and knowledge users: technology transfer.

The Stevenson-Wydler Technology Innovation Act of 1980 says the phrase is intended to mean "the transformation of Research and Development into processes, products, and services that can be applied to State and local government and private sector needs."[2] Whether you call it dissemination of information or technology transfer, the process is the same. It involves a dissemination strategy integrating knowledge of the latest technological practices, procedures for their implementation, tactics for their integration into existing delivery systems, and evaluation designs to measure the achievement of technological mastery.[3]

The new electronic technologies that have been thrust upon Extension in the 1980s are offering educational opportunities of mind-boggling proportion. This is particularly true of the microcomputer. A survey of the Southern Rural Development Center in 1983, indicated that the vast majority of these institutions were involved in microcomputer activities.[4]

The Mississippi Cooperative Extension Service (MCES) has distributed microcomputer software to 35 other state Extension Services, indicating the widespread use of microcomputers by Extension.[5] These programs are readily available to vocational agriculture teachers who contact their State Extension office.

Extension recognizes the microcomputer as a new tool for conducting educational programs and improving office management. When Extension Services began using the microcomputer as a tool for conducting educational programs, it became apparent that specialists and agents could use the microcomputer to assist in conducting their programs. Microcomputer software was written to tabulate 4-H judging contests, keep records at shows, maintain records at Extension sponsored pig sales, calculate performance records at central bull test stations, and many more.

A few states; such as Texas, Oklahoma, Mississippi, North Carolina, and South Carolina; took the early lead in developing microcomputer software for clientele. The Mississippi Agricultural and Forestry Experiment Station (MAFES) and MCES developed microcomputer programs for clientele use, including vocational agriculture teachers in such areas as farm recordkeeping, land forming, catfish pond management, swine recordkeeping, beef cow-calf recordkeeping, sprayer calibration, farm budgeting, and least cost feed formulation. MCES is currently distributing 30 different microcomputer programs developed by MAFES, MCES, and other Land-grant institutions.[6] The April 1984 edition of Updated Inventory of Computer Programs lists approximately 1770 different computer programs distributed by 48 state Extension Services.[7] Many of these programs are available either free or at low costs to vocational agriculture teachers.

Data Bases

Another approach to serving the educational needs of clientele through the use of computers involves large central data bases of programs and information which can be accessed through remote terminals. The more common ones are AGNET from Nebraska, CMN in Virginia, and FACTS in Indiana. To use one of these systems requires a terminal or a microcomputer to serve as a terminal, a telephone line, necessary communication hardware and software, and the system access subscription. The content of programs on these systems covers most of the disciplines represented by Extension and vocational agriculture and involve decision aids, information storage and retrieval, and instructional processes.[8]

Educational programs associated with microcomputers are not limited to agricultural areas. Home economics, 4-H and community resource development are also represented. Microcomputer programs in home economics include such areas as housing, home budgeting, nutrition and meal planning, health care and family living. Kentucky has developed a set of materials for a statewide 4-H computer project.[9] In Mississippi, the Extension Community Resource Development Department is entering its second year of a special project to introduce microcomputer technology to small town and rural county governments.[10]

Extension Services conduct seminars, workshops, and field days to give clientele an opportunity to explore and learn more about microcomputer technology. Computer specialists advise clientele how to analyze their situation, determine needs, and decide whether they need a computer. Workshops also include software and hardware evaluation and selection. Subject matter specialists conduct training sessions in the use of application software relative to their subject matter area. Vocational agriculture teachers should make the appropriate contacts to participate in these sessions.

Management

The other major application of microcomputers in Extension is in the area of office efficiency equivalent to or greater than that of the telephone, electric typewriter, or electronic calculator. It can be used as a word processor to rapidly edit and update documents, prepare form letters, and recall, revise, and reproduce periodic materials and mailings. A data base management package with the microcomputer can be used to maintain and print mailing lists, club enrollment, fair and livestock show entries, and publication inventories. The electronic spreadsheet package is helpful to office management in the area of budgets and other applications that require the manipulation and recalculation of numbers.

Electronic mail is another office management application in use in some states with microcomputers. South Carolina's Extension Service is using electronic mail to transmit short messages among state, district, and county offices.[11] Other states are using a similar service while still others are exploring the possibilities. The Ag Ed Network now serves a similar role for vocational agriculture teachers.

Administration

The use of microcomputers in Extension requires some adjustment in organization and personnel. Some states have formed a separate computer services department to handle all affairs related to computers. Other states have assigned that responsibility to an existing department such as the information department. In still other states, existing suject matter departments who took the lead in working with microcomputers found themselves handling all microcomputer work for the organization. In most cases, this was the agricultural economics department or the agricultural engineering department.

Most states seem to be moving toward a separate computer services department.[12] Personnel in these departments have varied backgrounds. In most cases, the departments are staffed with experienced Extension professional from other disciplines who have been heavily involved in using microcomputers. One or more computer science trained individuals are also on staff to handle the technical aspects of the work. Programmers may be full-time professionals or part-time students. Students majoring in computer science serve well in this area. At MCES, one full-time programmer and four part-time students develop and maintain software for the microcomputers.

These computer service departments are responsible for working with subject matter speicalists in software development and maintenance, evaluation of software from other states, software distribution to clientele and other Extension offices, coordinating hardware and software purchases, computer literacy training for personnel and clientele, and general consulting work with Extension personnel and clientele.

The Future

All the experts seem to agree that the microcomputer is here to stay. Right now it is receiving maximum exposure through the advertising media. This will eventually stabilize as the microcomputer finds its place in society. What will be Extension's future relationship with the microcomputer? Here are a few thoughts.

All county Extension offices will have at least one microcomputer. Those without, want one. Those with one, want another. Eventually one microcomputer will be needed for educational programs and another one for office management.

All subject matter departments and administrative departments will have either microcomputers or terminals connected to a central computer system. In some departments such as agricultural economics and accounting, each staff member will have a microcomputer or terminal.

Within a state organization, the state, district, area, and

(Continued on Page 22)

Microcomputers in Cooperative Extension

(Continued from Page 21)

county offices will be networked together by computer for data exchange, electronic mail, and reporting. State offices are now linked nationwide through USDA and a central computer.

All publications will be stored on a central computer in the state office. Specialists will update publications via their microcomputer. Manuscripts will be sent electronically to the publications departments for electronic typesetting. All graphics for publications will be generated electronically. Field offices will have the capability of accessing publications electronically and producing a printed copy of all or part of the publication.

Microcomputer technology is here to stay. Five years ago Extension was asking if it would adopt the technology. That question is no longer relevant. The question now being asked is, "What new and exciting things will we be doing with microcomputers in 1990?"

The Cooperative Extension Service perceives the microcomputer as a tremendous opportunity, not a problem to be solved or a situation to be ignored. We also recognize that it is not an electronic god destined to solve all our problems. But it is a new method for delivering our educational programs. It is new technology for us to aid our clientele in adopting. And finally, as educators, it is a new challenge to whet our professional appetites.

References

[1]Smith-Lever Act as Amended in 1962, Public Law 83, S. 1679, Chapter 157, (1962)

[2]Stevenson-Wydler Technology Innovation Act of 1980, Public Law 96-480, S. 3211, Congressional Record, vol. 126, (1980)

[3]Michael H. Parsons, "Technology Transfer: Programs, Procedures, and Personnel," paper presented at 63rd Annual Convention of American Association of Community and Junior Colleges, New Orleans, (April, 1983), p.1.

[4]Jane Rendiero and William W. Linder, "Status of Computer Applications in the Southern Land-Grant Institutions, Experiment Stations/Extension Services/Resident Instruction," SRDC Series No. 63, Development Center, September, 1983), p. 42.

[5]Out-of-state contact records, Computer Applications and Services Department, (Mississippi State University, MCES, (1984).

[6]Catalog of Microcomputer Software, Computer Applications and Services Department, (Mississippi State University, MCES, July 15, 1984).

[7]J. Robert Strain and Stephanie Simmons, Updated Inventory of Computer Programs, (Gainesville: University of Florida, Institute of Food and Agricultural Sciences, April, 1984).

[8]Keith G. Douce, "A Blue-Sky Perspective," Journal of Extension, XVII, (May/June 1979), pp. 12-13.

[9]George A. Duncan, George M. Turner and Linda A. Bach, A Series of 4-H computer project manuals, (Lexington: University of Kentucky, Cooperative Extension Service, 1982).

[10]James R. Carpenter, Technology Transfer Through Microcomputers, plan of work submitted to Extension Service-USDA, (Mississippi State University, MCES, 1983).

[11]Ed Elliott, Interview with W.A. Tinsley, project coordinator, Kellogg Project, Cooperative Extension Service, Clemson, University, (Mississippi State University, MCES, May, 1984).

[12]Out-of-state contact records, Computer Applications and Services Department, (Mississippi State University, MCES, 1984).

THEME

Suggestions For Using Microcomputers In Vocational Agriculture

Can you imagine what it would be like to teach an agricultural welding class with one welder? Many vocational agriculture teachers are expected to teach the use of microcomputers with only one available in the classroom. How can a microcomputer be used effectively when there may be 15 students in a class and only one computer? Many teachers have been struggling with this question. The following are some suggestions for using a microcomputer as an effective teaching tool in a classroom.

By Vernon D. Luft and Mark Zidon

(Editor's Note: Dr. Luft is a Professor and Mr. Zidon is a Graduate Assistant in the Department of Agricultural Education at North Dakota State University, Fargo, North Dakota 58102.)

Demonstrations

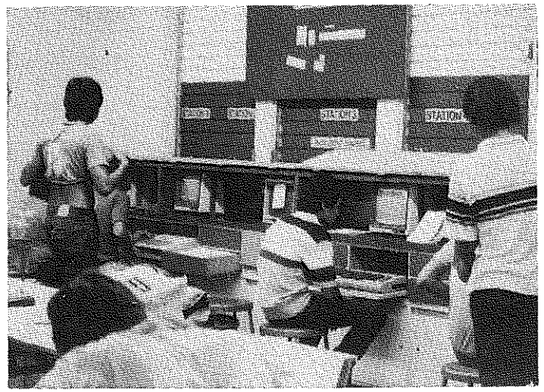
The first step to effectively teach the use of microcomputers is to provide the class with a demonstration of the program used. Demonstrations are a traditional method of teaching for vocational agriculture teachers. The same is true when teaching how to use a microcomputer, the monitor must be set up so it is visible to all students. Additional monitors can be located throughout the room. The use of a student to operate the keyboard is helpful when demonstrating. This frees the teacher to more easily explain what is happening on the monitor. It also brings out the typical errors a student might make while operating the keyboard. When the demonstration is complete, at least one student is familiar with the keyboard operation for that particular program. This student can then be used as a resource person to help other students during assigned work. The teacher should go over an example during the demonstration of the assignment the students will be expected to complete.

Ideas for Use

Even though a vocational agriculture teacher may have only one microcomputer in a class of many students, it is a good idea to limit the number of students using the microcomputer to three. One student per computer is great if you have enough computers. Two students per computer may be better than one because the interaction between them may aid in the learning process. With three students to a computer, one can operate the computer while the other two observe. The discussion of the two observers should center around the action of the computer and the operator. When four or more students are placed on a computer, the observers begin to form small social groups independent of the computer operation. The discussion often centers around things other than what is happening at the computer.

Another way of effectively using a limited number of computers in a large class is by using a rotational assignment system. Assignments should be given in three parts: 1) hand calculation problems; 2) computer problems; and 3) written summary. Divide the class into two groups. Group A can work first on the computer problems while group B works on written problems. As students complete computer work, they switch with students in group B. When individuals complete both the written and computer problems, they may work on the summary. The summary should include a written evaluation of the two assignments responding to guide questions developed by the teacher. Students who complete assignments early may be given extra computer problems. However, care must be taken to see that students are not hurrying through the work to get extra time on the computer.

The "buddy system" may be used as a method of using a limited number of computers. As class begins, the teacher might select one of the advanced students in the class and quickly have him/her go through the computer assignment.



Microcomputer stations permit students to use application software to aid learning. (Photograph courtesy of Ken Kajihara, Vocational Agriculture Instructor, Waimea High School, Waimea, Kauai, Hawaii 96796.)

While you teach class, this student works the problem. When he/she has completed the assignment, he/she gets a "buddy" and demonstrates the assignment to him/her. The second person now runs the program. This proceeds until all students have completed the assignment. Assignments should be kept very short and simple. The advantage to this method is that all students get time and instruction on the computer while no class time is lost. The obvious disadvantage is the distraction problem while class is in session. If the assignments and computer programs are simple enough, this same rotation procedure can be used without using the "buddy system." This system, however, should not be used continually as students tire of it quickly and they can easily find ways to cause problems with the procedure.

Perhaps students would like more time to use the computer than what is provided in class. In this case, outside homework may be an opportunity for them to constructively use the microcomputer. While homework is often not popular with students, they may welcome it because it gives them an opportunity to use the microcomputer during study halls, before school, or after school.

Pooling Resources

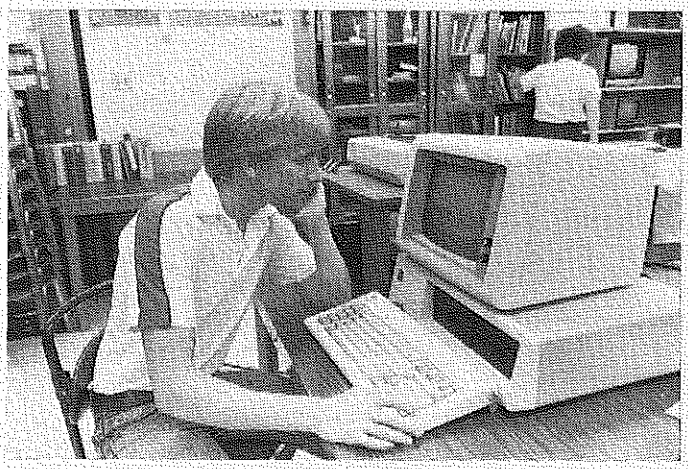
Many schools may have a microcomputer in several departments throughout the high school. It is suggested that these computers be combined into a central computer cluster. When this is done, enough computers would be available so most students in the class can use the computer at one time. There are some disadvantages to pooling computer resources in a central location. The disadvantages include: 1) scheduling use of the room may be a problem; 2) it requires a room exclusively for computer use and a manager to operate the computer cluster; 3) the computer that you liked having in your classroom will be lost to the computer cluster; and 4) time is lost in moving students from the regular classroom to the computer room. Though there may seem to be several disadvantages to a computer room, the advantage of having enough computers for your class outweigh the disadvantages. If microcomputers are consolidated into a computer cluster, priority must be established for their use. A priority list may look like this: 1) group class activities; 2) assigned classroom homework with specific learning objectives; 3) students doing extra work for class; 4) students using word processing or other programs to complete work for other classes; 5) students using computers for their own learning experiences; and 6) students using computers for entertainment. Lower priority students should be bumped by students wanting computers for a higher priority use.

Conclusion

The microcomputer can be an effective tool for teaching in the classroom just as a welder is effective in the agricultural mechanics laboratory. The computer must, therefore, be used wisely and constructively. A number of educational programs should be made available which contribute toward the attainment of the instructional objectives of the program.

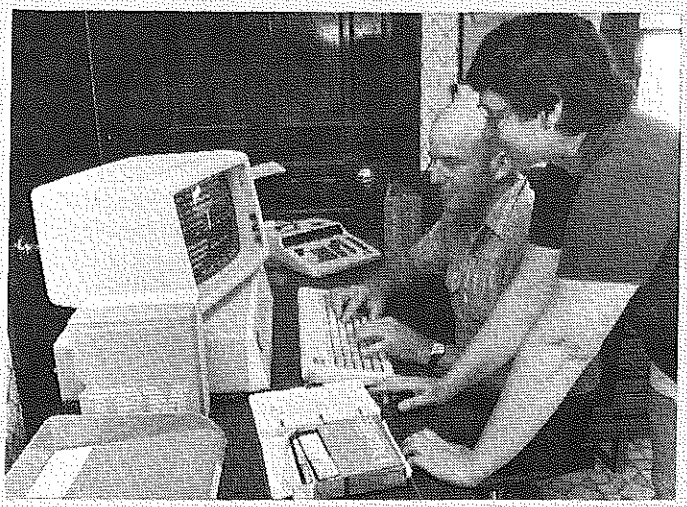
Stories in Pictures

Utility of Microcomputers



Students in the Classroom

Mobile Units in the Field



Adults in the Home

Competition and Recognition

(Photographs courtesy of Dennis Scanlon, The Pennsylvania State University; and the National FFA Center.)