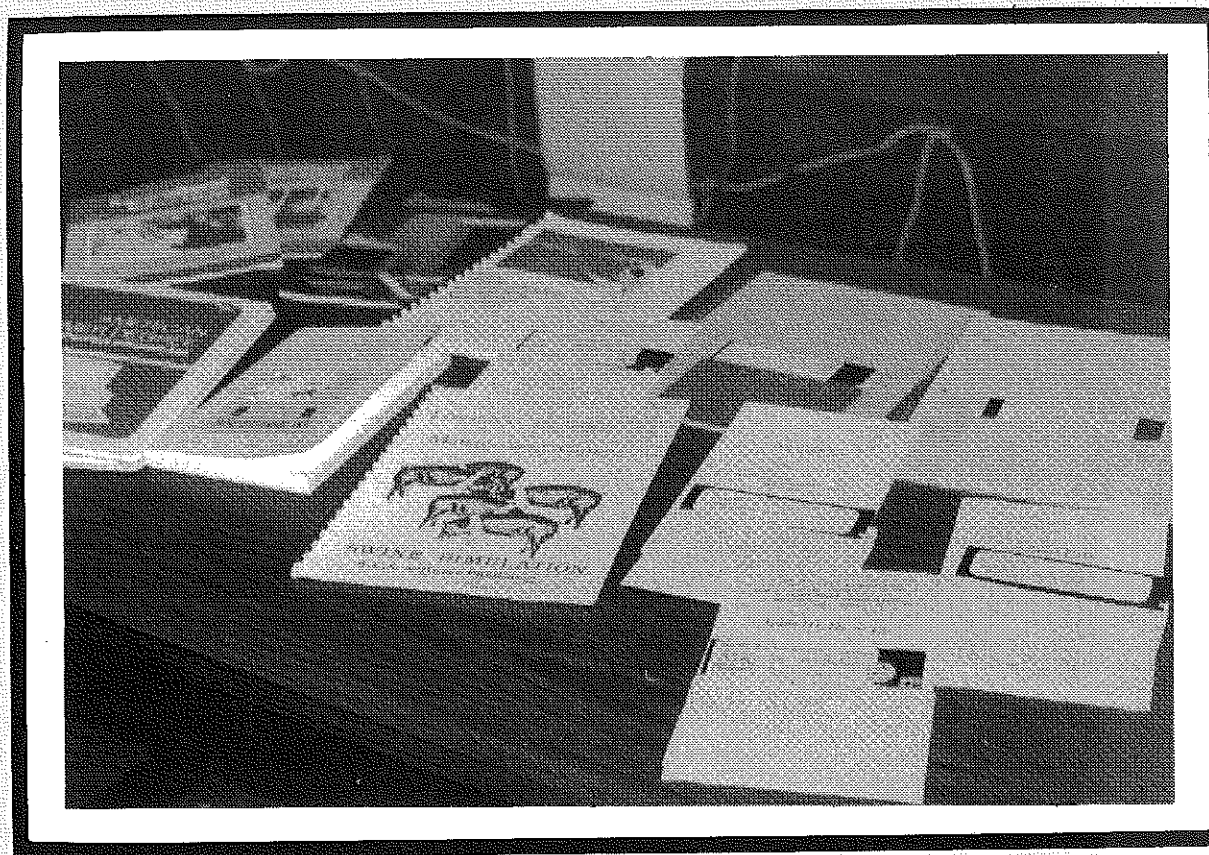


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Magazine



THEME: Instructional Materials

THE AGRICULTURAL EDUCATION MAGAZINE



October, 1988

Volume 61

Number 4

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ARTICLE SUBMISSION

Articles and photographs should be submitted to the Editor, Regional Editors, or Special Editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed, double-spaced, and include information about the author(s). Two copies of articles should be submitted. A recent photograph should accompany an article unless one is on file with the Editor.

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Writing As A Lost Art

Reading, (w)riting, and (a)rithmetic, i.e. the 3-R's, have long been considered the "BASICS" in education. Americans proclaim that individuals must demonstrate mastery of the 3-R's as a condition of being an "educated" person. Just how rigidly we hold to this proclamation came into question during Terrel Bell's tenure as secretary of the Department of Education. Secretary Bell and President Reagan used the *A Nation at Risk* report in 1983 as shock therapy to say that our standards had vanished.

Our leaders also told us to expand the basics and include foreign language, the humanities, and high technology. A few arguments in favor of the first two areas being "basics" were weak. Arguments in favor of technology being a "basic" were even weaker. Too often technology, including that falling under the "educational" umbrella, is viewed as something more than a vehicle for delivering instruction. Media and related electronic gadgets change quite rapidly. Principles, concepts, and BASICS rarely change! Technology's short life precludes it being a basic. This contention leads to the focus of this article: using technology to improve a basic skill - writing.

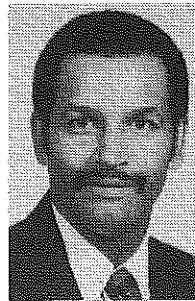
Teachers as Writers

Individuals who subscribe to the above position know that the basics enable us to teach agriculture. Because so much of the teaching-learning process involves writing, agricultural educators must (1) have good writing skills and (2) be able to help students improve their writing. Numerous instances can be cited to show that this area is a major weakness in our profession: poorly written FFA applications, unbelievable papers submitted by students, weak lesson plans from student teachers, disgraceful business letters, and yes - more than a few articles submitted by graduate students and professors for publication in this journal.

The written word is the best way to preserve and transmit our knowledge of agriculture. Lesson plans, letters, reports, books, journals, and related materials allow us to shape the minds of America's future. We must do a better job of communicating via the written word. To do anything less means that agricultural education is truly at risk. One solution is to blame English teachers. Another is to share the responsibility.

We must inject more writing into agricultural education. Students must write and rewrite. We must critique more writing if students are to improve. As professionals, we must also write more and do it with clarity and correctness. Some will argue that we are unqualified to help students with their writing. This is a valid argument if bachelor's and master's degrees in agricultural education are so watered down that they cannot be trusted to judge whether teachers are educated individuals. I cannot buy the argument. Writing is so basic that it transcends all disciplines, including agriculture.

With a few exceptions, my best teachers of "writing" were



BY BLANNIE E. BOWEN, EDITOR

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not English instructors. Teachers, graduate students, and professors have the ability to write right. The secret is to develop the required discipline and motivation. Each time I critique someone's writing, I reflect on my advantage as an editor. Sometimes I get reminded, and quite courteously, about the typos, grammatical horrors, and technical agriculture disasters I "published" in the last two issues. My response is simple: Perfect writers never write.

Technology as ONE Solution

If writing is so important, how can we improve? Use computer technology as one vehicle to hone your writing skills. I contend that word processors were invented solely to keep me from killing my typing teacher (my best speed was 18 words a minute). Take the following advice with caution.

- Learn a SIMPLE word processing package.
- Use a spelling checker to spot typos.
- Invest in a grammar checker to help with basic problems.
- Use a readability program. My program said this article requires a 12th grade reading level and it has 53 sentences that average 13.5 words.
- Always get a second opinion so you can blame someone else.
- Remember that good wine and writing require time.

About This Issue

This issue focuses upon instructional materials and equipment for agriculture. While reading this issue, remember that it is the teacher, not the materials, that brings about student learning. A.P. Bell, Professor and Head of Agricultural Education at North Carolina A&T State University in Greensboro, NC, served as theme editor for this issue.

About the Cover

Manipulative aids, such as simulations, games & tutorials, are readily available for use by vocational agriculture teachers. Printed materials, including manuals, monographs, and textbooks, are useful for teaching computer applications. (Photo courtesy of Barbara Malpiedi, N.C. State University.)

Criteria for Selecting Instructional Materials

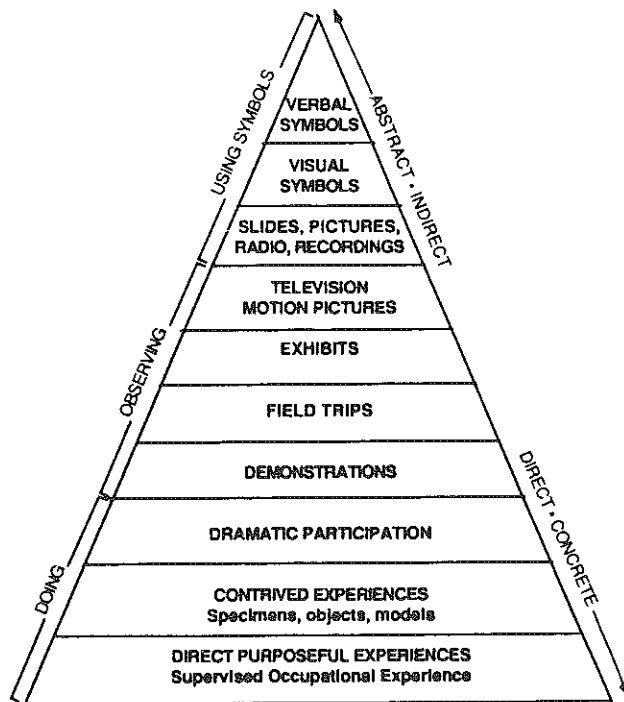
One of the most important activities performed by an agricultural education instructor is the selection of instructional materials to enhance student learning. Students come to the instructor with different learning styles, unique backgrounds and experiences, and varying levels of interest. It is incumbent on the teacher of agriculture to communicate with students in a manner that meets their needs. This article is offered as a means of advising teachers in the selection and use of instructional materials. It relies on time-tested information and suggestions to bring appropriate materials to bear on instructional needs.

Instructional materials are defined in this article in very broad terms — from the traditional printed materials such as student textbooks and manuals, and audiovisuals such as slides, filmstrips, movies, and audiotapes, to “the new kids on the block” — computer software and videotape. Instructional resources also include specimens, models, charts, natural materials, and even plants or plant parts and live animals. Sometimes these specimens and local natural materials are overlooked or forgotten in the quest to be up-to-date with new technology.

Concrete and Abstract Experiences

Dale’s Cone of Experience (shown below) can be used as a guide to remind us of how these instructional materials impact the learner.

Instructional materials run the gamut from the abstract to the concrete. Lecturing or telling and reading are the most



BY ROGER D. ROEDIGER AND WILLIAM L. HULL

(Dr. Roediger is Director of the Ohio Agricultural Education Curriculum Materials Service and Dr. Hull is a Professor of Agricultural Education at The Ohio State University, Columbus, Ohio 43210-1099.)

abstract forms of learning for the student. Actual experiences in which students are involved and participating are the most concrete. Many audiovisual resources, which include videotapes, tend to be midway between abstract and concrete.

The most concrete learning resources should be used for the slow-learning student. For the gifted student, the teacher can use the more abstract resources. Regardless of the level of abstractness or concreteness, active participation by the student is critical to good learning. Activities and resources that are lower on the cone tend to have natural settings for rich, personal, sensory experience. The teacher must increasingly make every effort to consider means for student involvement as teaching moves to the highly abstract verbal experience.

Media Versus Method

It is important to focus on how a particular type of instructional material can best contribute to instruction. One should be less concerned with whether one medium or instructional material is superior to another. We are interested in the appropriate use of material. Specific types of instructional materials or media tend to come on the scene rapidly, gain popularity, then gradually fade into the background of use. With each new type, research focuses upon trying to prove or disprove its effectiveness as a learning tool compared to other materials. Unfortunately, instructional materials influence very little of the variance in learning. Without strict controls, the general outcome of these studies is that little, if any, significant difference in student learning can be attributed to the type of medium or material.

The focus of our concern need not be upon which instructional material is best, but rather what criteria should be

applied to select *appropriate* material for maximum learning regardless of whether the material is videotape, slides, printed material, or some other type of resource.

Previewing Material

Any material that the teacher is considering for use in teaching should be previewed. Considerations that should be remembered are what the teacher wishes to accomplish; what the needs, interests and abilities of the students are; and the existing constraints of money, equipment, facilities, and time.

A list of reading materials which may be considered for previewing could include:

- textbooks
- workbooks
- reference books
- periodicals or journals
- pamphlets and brochures
- newspapers
- programmed materials
- study guides

Selecting Reading Materials

Readability

While the level of readability of printed material should be within the capabilities of the students, it should be difficult enough to challenge them, but not so difficult as to discourage them. In lieu of formal readability formulas, a teacher can evaluate the complexity of words and sentences in the material. In general, reading difficulty increases with a greater number of syllables per word and words per sentence. Complex sentence structure and difficult or technical words can make the material more difficult to read and/or to comprehend. However, teachers should not shy away from materials with technical terms that are used in the occupational area being studied. The students' future success in the occupation will likely be enhanced with a good understanding of the technical terms used in the industry.

Typeface of the text should be of a reasonable size. It should be clear and legible for ease of reading. Materials printed in two columns per page or having lines that are no longer than about two-thirds the width of an 8½ inch page are preferred over the line lengths that run the full 8½ inch page width. The shorter line length improves ease of reading.

Printed materials will vary in style and format. Much of the difference such as design and generous use of white space have to do with eye appeal and interest. These differences seem to provide little if any advantage to the students' ability to learn from the materials.

Use of Illustrations in the Text

Pictures may be worth a thousand words in some instances, but the nature of illustrations or photographs in printed materials should be examined for appropriateness. Inappropriate use of illustrations or photographs can be distracting or considered a "noise" effect on the reader.

Poor selection by the author of photograph versus graphic illustration can also decrease the effectiveness of material. In the study of the anatomy of plants and animals or parts of equipment, a line drawing is often a better choice than a photograph to enable the student to define and understand the components.

The use of color in printed materials often adds interest but also cost to materials. Unless the color is essential to



Diane Deyonker, Senior Instructor of Natural Resources at the Toledo Agriculture Education Center, shows Margie Pawlaczyk how to identify features on a mallard duck specimen. Margie, a senior, plans to go to Owens Tech next year.

learning, such as to show correct color of meat cuts or the various colors of flower varieties, the use of color may only increase the cost of the material without assuring that students will learn better than with black and white material. The best use of color as an aid to learning is in identifying component parts of objects, concepts or processes.

Selecting Audiovisual Materials

The list of audiovisual materials that a teacher has to select from is very large and includes:

Audio — tape and disc recordings, radio, telephone, teletexture, sound distribution systems

Visual — picture, flash card, photograph, slide, filmstrip, flip chart, poster, specimen, actual object, map, globe, model, flannel graph, hook and loop board, transparency, chalkboard

Audio-Visual — television, VCR and videotape, movie film, sound filmstrip, sound-on-slide slide, laser disc and computer

There are some criteria of selection that are generic to most audiovisual materials that a teacher may be considering.

Does the content match lesson objectives?

Unless materials match the objectives of the lesson, other considerations are meaningless. The teacher should have clearly defined objectives in mind — a prerequisite to previewing instructional resources for selection.

Is the material appropriate for the grade level, needs, abilities, and interests of the students?

Content should start at the learner's level and build on his/her present abilities toward those expected as a result of the teaching. Since students vary considerably in reading ability as well as many other skills and capabilities within each class, the decision needs to be made regarding what level or type of material to select. Using a variety of media will provide an additional means to match the varied abilities and interests of students within each class.

Is the content logically sequenced?

Students will be able to comprehend material more readily if it is organized in a logical sequence. This could be the order

(Continued on page 6)

Criteria for Selecting Instructional Materials

(Continued from page 5)

in which activities or events normally occur or a time sequence. Another possible sequence pattern is a natural progression from simple to more complex content. Without a logical step-by-step procedure for solving a problem or performing a task, students may become confused.

Is the material technically well produced?

The visual aspect of audiovisual material should have sharp, clear, correctly exposed, and true colors. The subject of the material should be shown clearly and in a manner that can be understood by the student. A picture that is unclear, too dark or too light, or with too small an image is of little teaching use and is a waste of resource dollars.

The audio aspect of audiovisual material should be clear and audible. When the sound is difficult to comprehend or distracting, students are readily bored by what may otherwise be good teaching material.

Is the material current and accurate?

The content of instructional materials should be current with today's technology in order that students have realistic preparation for their careers. For example, materials used to teach soil tillage today would be woefully lacking if they included information on only moldboard plowing.

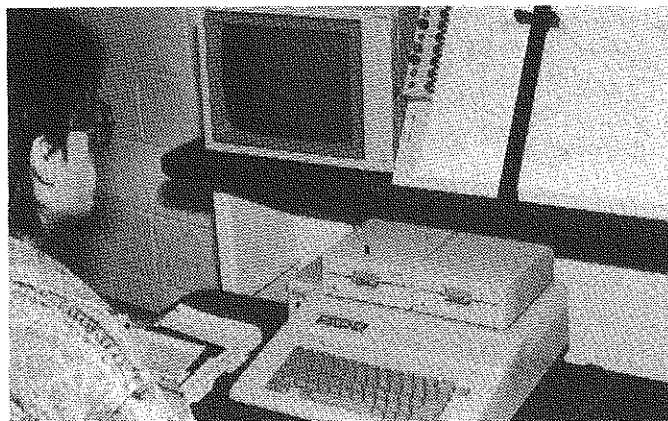
While technical content is a basic aspect in dating materials, other factors also affect the students' image of the materials. Such subtle items as outdated hair styles, clothes or cars used in visual materials often lessen the credibility in the eyes of the student.

There should be evidence that the information in the material is accurate. In cases where the teacher does not have the experience to determine the accuracy of content, outside expert help should be consulted.

Is the material interesting and motivational to the student?

Producers of instructional materials may rely upon the use of color or eye appealing layout and design to create student interest. With newer computer and video technologies, exotic sound and sight techniques and special effects can be used in an attempt to 'grab' students' interest.

While these approaches may be useful in getting the students' attention and leaving the students feeling good about the presentation, they may do little if anything to improve the learning outcome of the subject. Part of the criteria for interest and motivation of students should be that the materials provide rich experiences to students and show the



Doug Krueger, a senior at the Toledo Agriculture Education Center, draws a landscape design using computer-assisted software. Students in Kevin McCann's Landscape Design class learn to operate this equipment and create their own designs. (Photos courtesy of the authors.)

relationship of the subject to the problems they face. Additional sensory appeal is 'icing on the cake.'

Do the materials reflect an equity of the many characteristics of society?

Materials should reflect the multi-ethnic nature of our society and recognize that individuals take pride in their race, religion, sex and social backgrounds. The materials should be free of prejudice and stereotypes and give equal emphasis to the contributions of all groups of people.

Do the materials fit the teaching situation?

The available funds, facilities, equipment, and time for teaching need to be considered in the selection of materials. Computer software may not be the most appropriate choice if either funds or equipment are lacking to use this medium effectively.

If a lesson is only one hour long, use of a videotape which could run the full hour may not be appropriate. No time would be left for student interaction, discussion, or other strategies that need to be incorporated for effective learning.

Summary

In the final analysis, the instructor is the one who is responsible for selecting or developing instructional materials for students. An instructional material is a tool to vary, enhance, and support the communication channels to the student. The appropriateness of the material depends upon the instructor's knowledge of the students, the time, and other resources available to manage instruction, and, most importantly, a clear sense of purpose of the instructional encounter.

Reference

Figure 1 from "The Cone of Experience," Edgar Dale, *AUDIOVISUAL METHODS IN TEACHING* (Dryden Press, 1969).

Coming in November . . .

The FFA at 60

Instructional Materials For High School Vocational Agriculture Students

The quality of education in our public schools has been a hot issue over the last six years. The report issued by a special commission on secondary education took a closer look at what public education is doing and not doing. You probably remember the publication, *A Nation at Risk, the Unfinished Agenda*, and related follow-up reports. During this election year, the issue of quality education at the secondary level fuels the concern about what public education should be accomplishing. The National Council on Agricultural Education is taking a closer look at what is good and bad in agricultural education, especially in vocational agriculture at the secondary level.

The quality of vocational agriculture is influenced by the types and quality of instructional materials we use to help students learn. This is a fact and it is not new. We have known this for years. But still, there are many vocational agriculture teachers using reference materials that cover yesterday's technology, production procedures, and techniques. Obviously, just because something is new does not necessarily make it better. However, with so much concern about the air we breathe, the water we drink, and the food we eat, it is imperative that we expose our young people to the best and latest technology available. We cannot do that by using reference books and materials with copyright dates of 1956 and 1976. Those materials are out-of-date and should be moved to vocational agriculture's historical files.

Organize Your Program

I am concerned today about how we can identify reference books and materials that are technically correct and up-to-date as well as fun and interesting for students to read. If we take a systematic approach to this process, we will insure that we are doing our best job at this task. There are some preconditions that must be accomplished. First, the vocational agriculture program must be well organized. Immediately, you are probably asking the question, "What does it mean to have a well organized program?" There are several texts that will explain that to you. However, all are saying that your program must have as a minimum: a) a **philosophy** — the big sun that lights the way and keeps you on the right path, b) **program objectives** — the map that keeps you on the right road, c) an **advisory committee** — the cross-section of community leaders you are serving who provide guidance and advice relative to the work world, d) **subject matter areas** — instructional focus of the program, e) **units of instruction** — general principles, theories, and facts that students should learn, f) **lesson plans** — specific principles, theories, and facts that students should learn and include appropriate student learning activities and resources, and g) a **program of evaluation** — method by which program effectiveness can be determined based upon philosophy and objectives. In addition to these items, the vocational



By CONNIE D. BAGGETT

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agriculture program should have four basic components — an applied agricultural science information foundation (technical agriculture), leadership development (FFA), laboratory experiences (mechanics, animal, and/or land laboratory), and occupational experience activities (SOEP).

Keep Your Program Current

What many teachers have done is type the four components and activities into a beautiful document that has never been changed within the past 10 or 15 years, forgetting that an effective program must evolve, be refined, and grow. The Williams/Penn State University Computerized Curriculum Program allows for instant revisions and beautiful printed copies. You may want to further investigate this microcomputer system for your program. Now we are ready to consider the problem of selecting instructional materials.

Identify Good Sources

There are several sources of excellent agricultural instructional materials. They include the **American Association for Vocational Instructional Materials (AAVIM)** at the University of Georgia, the **Curriculum and Instructional Materials Center** at Oklahoma State University, the **Curriculum Materials Service** at Ohio State University, the **Instructional Materials Service** at Cornell University, the **Instructional Material Service** at Penn State University, the **Instructional Materials Laboratory** at the University of Missouri-Columbia, the **Vocational Agriculture Service** at the University of Illinois, the **Vocational Education Production (VEP)** at California Polytechnic State University, and the **Vocational Instructional Service** at Texas A & M University. You will find that these non-commercial sources provide high quality, reasonably priced materials. In addition to these sources, there are state departments of education and curriculum consortia from which excellent materials may be secured. I only skimmed the surface in identifying non-commercial sources. After including commercial sources, choosing the best materials is a big, big decision.

(Continued on page 8)

Instructional Materials For High School Vocational Agriculture Students

(Continued from page 7)

Benefit From Team Work

By this time you are probably puzzled as to how to choose the best agricultural instructional materials appropriate for your geographic area. You may want to use a team approach. At your next local vocational agriculture teachers' association meeting, organize an instructional materials screening and selection committee. Choose committee members who have strong, well organized programs (programs described above). Identify an instructional area in which teachers have noticed an instructional materials shortage. Write for catalogs from the sources listed above. Order several copies "for review purposes only." I have worked with most of the sources listed above and they will send your local association copies for a "30 day review." Obviously, you should not damage the materials or you may be required to purchase them.

Set High Standards

As the committee begins the reviewing and screening process, there are several points to consider in identifying the appropriate and best materials. The first thing I look for while reviewing materials is whether the title truly represents the content of the material. It is frustrating to order something by title and it is entirely different from what the title or name indicated. I always return materials like that. Good instructional materials should also be activity oriented. **Learning by doing** is more effective than other approaches. However, narrative materials do play a major role in learning for a few students. By all means, agricultural instructional materials must be technically correct and up-to-date. The worst thing we can do to students is to teach technically incorrect or obsolete information. Helping students "un-learn" technically inaccurate materials is a difficult task.

Likewise, if materials are technically correct but written for college graduates, we are probably causing unknown emotional and psychological damage to students. Much frustration develops from this situation. I use a microcomputer program produced by *Encyclopedia Britannica* to determine reading levels. This program generates reading levels for the Fry, Flesch, Fog, and Raygor indices.

The last big concern is whether the material will help students grasp concepts and principles typically experienced in agriculture. The field of agriculture is built upon scientific principles and concepts. Students are expected to apply principles and concepts in real situations during high school and after graduation. Therefore, good instructional materials must help students develop these skills. Over the years, I have used the form in Figure 1 to aid in screening and selecting instructional materials. Using this evaluation form makes things somewhat easier because you have a method by which similar materials can be compared. Your local agriculture teacher association's instructional materials

committee can now make recommendations to the group. But, don't buy any materials just yet. We have *only* discussed the technical and usefulness of the materials.

Be Aware of Guidelines

By now you probably realize that selecting good and appropriate instructional materials is not easy. To save yourself some grief, now consider the affirmative action issue. Why all the fuss about affirmative action? Programs receiving federal funds must comply with federal guidelines and regulations. Specifically, instructional materials cannot be of a discriminatory nature. What does that mean? Well, materials you use in your instructional program should not portray any race or gender in a way that misrepresents or undermines them. Pictures that are often used in reference materials should not be sexually biased. For example, suppose you are using materials that discuss aspects of agricultural mechanics. These materials include several pictures of individuals working on parts of a piece of equipment. Some of the pictures should show female subjects as well as their male counterparts. Obviously, what federal regulations and guidelines are trying to achieve is the realization that females can be as good a mechanic as males and that job opportunities exist for them. Written descriptions of such work activities should also be gender neutral. In other words, the materials should not refer to the agricultural mechanic as "he."

The U.S. Department of Education has produced several pamphlets that zero-in on common shortcomings of instructional materials. Several concerns are listed below:

Sex Biased Materials

In narrations:

- Are female voices used only when dealing with traditionally female occupations such as flower arranging?

As role models:

- Are women shown caring for the home and children while men are earning the income?
- Are bosses, executives, and leaders always pictured as males?

Racially Biased Materials

In narrations:

- Are voices of minorities used only when dealing with traditionally lower paying occupations such as gardeners or grounds keepers?

As role models:

- Are minorities shown caring for facilities while whites are shown in positions of power and prestige?
- Are bosses, executives, and leaders always pictured as whites?

Obviously, I have just touched the surface of the inconsistencies that may exist in agricultural instructional materials. You must be the judge of the appropriateness of the materials you use. You are ready to make a decision and purchase agricultural instructional materials for your vocational agriculture program. **GOOD LUCK!**

INSTRUCTIONAL MATERIALS EVALUATION FORM

Subject Area: _____

Title of Material: _____

Date: _____ Source: _____ Cost: _____

Type of Material: _____ Evaluator: _____ Today's date: _____

Directions: Read each question carefully and indicate your frank assessment of the material.

1. To what extent does the title indicate the content of the reference?
 Not at all Average Quite well
2. Is the reference narrative based or activity based?
 Narrative based
 Mostly narrative with some activity
 Mostly activity with some narration
 All activity
3. To what extent was the material in this reference technically correct?
 All of the material was technically correct
 More than half of the material was technically correct
 Less than half of the material was technically correct
 Very little of the material was technically correct
4. How would you rank this material among others received?
 Much higher
 Slightly higher
 On the same level
 Slightly lower
 Much lower
5. How would you rank this material in comparison with presently existing materials in your program?
 Much higher
 Slightly higher
 On the same level
 Slightly lower
 Much lower
6. To what extent is the reading level appropriate for vo-ag classes?
 Too difficult Slightly difficult
 Good level Too easy
7. To what extent can this material be used in the application of concepts and principles needed by vo-ag students?
 To a great extent To very little extent
 To some extent To no extent
8. To what extent would the material aid in developing skills needed by vo-ag students?
 To a great extent To very little extent
 To some extent To no extent
9. Does this reference contain enough material to be very useful?
 All of the material is useful
 More than half of the material is useful
 Half of the material is useful
 Less than half of the material is useful
 None of the material is useful
10. To what extent does the material necessitate the use of supplementary instructional media (films, slides, tapes, etc.)?
 Does not need any supplementary material
 Could use some supplementary materials, but is not necessary
 Some supplementary material is necessary
 A lot of supplementary material is needed
11. In what manner could this material most effectively be used by the teacher?
 Supervised study
 Small group discussion
 Individualized instruction
12. The best use for this material would be:
 Program planning by the teacher
 Lesson planning by the teacher
 Student use
13. In what manner do you see this material being most useful to local teachers?
 As a student manual (reference)
 As a library resource
 As a teacher's resource
 For adult use
14. To what extent would you recommend that this material be purchased?
 To a great extent
 To some extent
 To little or no extent

Figure 1: Instructional Materials Evaluation Form

NEW PRODUCT

COMMUNITY-BASED ORGANIZATIONS AND VOCATIONAL EDUCATION: THE PATH TO PARTNERSHIP, by Lawrence Neil Bailis, helps clarify the role of CBO's in vocational education by explaining what CBO's are, summarizing the role they have played in employment and training programs in the past, and outlining the future prospects for coordination between the mainstream vocational education system and CBO's.

Materials summarized in this new

publication suggest that the advantage of CBO's over school systems may be in prevocational services.

At the time of publication, Bailis was Senior Research Associate at Brandeis University and Adjunct Assistant Professor, Boston University School of Social Work.

Order COMMUNITY-BASED ORGANIZATIONS AND VOCATIONAL EDUCATION: THE PATH TO PARTNERSHIP (IN319 — \$6.00),

50 pp., 1987, from the National Center for Research in Vocational Education, The Ohio State University, Publications Office, Box N, 1960 Kenny Road, Columbus, Ohio 43210-1090; or call toll free 1-800-848-4815 or 614-486-3655 inside Ohio and outside the continental United States.

The development of this publication was sponsored by the Office of Vocational and Adult Education, U.S. Department of Education.

Instructional Materials and the Computer

The focus of today's lesson is Identifying Plant Parts. As the teacher, I have several options for conducting instruction in this area. How do I most effectively communicate this subject? I could eloquently lecture to my students and tell them the names of all the plant parts. Hopefully, they will write the names correctly and imagine the appropriate location of the parts on the plant. I could call upon my talents as an artist, draw a plant on the chalk board or transparency master, and label the plant parts as I lecture. Either of these approaches should sufficiently bore my students or at least entertain them in revealing my shortcomings as an artist.

It seems to me that I need quality visuals that will complement my instruction, promote student interaction, and most importantly encourage efficient student learning. The microcomputer can help me accomplish the needed tasks. I plan to begin the class with a discussion of the importance of plants. A student accesses the AgriData Network, secures the day's market report for soybeans, and provides the class with current information regarding the economic importance of plants. In preparing for class and assuming that I am not satisfied with xeroxed plant pictures available from the text, I use the MacPaint program and sketch a plant with blank lines drawn to the various parts. My laser printer permits creation of quality handouts of the plant as well as a transparency master of the plant. Now, during the lecture/discussion, students can work along with me, labeling plant parts as we discuss their functions. To reinforce the instruction, the class moves to the computer lab where each student reviews the plant parts and functions through use of the Agri Quiz Plant ID program. The computer, as an instructional tool, has not only enhanced my teaching by permitting student interaction, but also has provided me with printed and audiovisual materials. The time I have invested in creating instructional materials is worthwhile if it promotes more efficient student learning.

The Computer as a Tool

Computers provide the teacher with a powerful tool. It should be used for CMI, computer-managed instruction, and for CAI or computer-aided instruction. With CMI, the teacher uses computer software (programs) as follows: to create printed and audiovisual instructional materials (handouts, transparencies, quizzes, slides); and to manage student data (grades, supervised occupational experience records). Computer-aided instruction involves using the computer to teach a lesson using manipulative aides such as puzzles, simulations, games, and tutorials. Often times, the sophistication level of these programs permits both lesson instruction and instructional materials production. These applications along with two others, use of electronic information systems and interactive video, need further exploration.

Producing Instructional Materials

Teachers must consider four factors when securing or developing instructional materials: time, dollars, the au-



BY BARBARA J. MALPIEDI

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dience, and quality control (Finch & Crunkilton, 1984). Generating handouts, study guides, transparencies, or puzzles takes time, whether they are developed on the computer, the typewriter, or by hand. The teacher's ability to use the computer, including familiarity with hardware and software as well as keyboarding proficiency, has the greatest impact on time. Moderate competence in using the computer greatly diminishes the amount of time needed to produce computer generated materials. Once materials are created and saved on data disks, the time required for technical revisions of the materials is less when compared to the time it takes to rewrite or retype the materials.

Budgets obviously limit the number and type of computer applications. Initial cost for the computer hardware, including peripherals, usually ranges from \$2,500 to \$5,000 per unit. Schools should take advantage of educational discounts and volume buying in order to diminish this cost factor. Software purchases represent the other major cost factor. The priority purchase should include general purpose software, such as a word processing program, database program, and spreadsheet program. On the average, all three programs cost less than \$500. These programs are useful for creating instructional materials and managing student information. Use the word processing program to create information handouts, worksheets, study guides, quizzes and transparency masters. Database and spreadsheet programs can be used as instructional tools for teaching agricultural project management. Specifically, use the programs to help students develop supervised occupational experience program inventories, budgets, and daily records. Spreadsheets also have computer assisted instruction applications. For example, design a spreadsheet that considers operational costs and product output for a poultry operation. Allow the students to solve a management problem by varying operational cost data in order to project output and profits. In this way, the spreadsheet serves as a manipulative instructional aid.

The PFS software series, as well as a number of other database and spreadsheet programs, includes options or additional compatible programs for producing graphic displays of the data. Graphs and charts are effective visual aids. Quality graphics production is possible with programs like MacPaint and MacDraw. Desktop publishing programs like the Newsroom and PageMaker are quite useful in prepar-

ing handouts, brochures, and pamphlets which combine text and graphics.

Additional software purchases are dependent upon the audience or students to be served, facilities, instructional content, and teaching method. Are your students receptive to vocabulary crossword puzzles or word searches? Do you believe these manipulative aids complement your instruction? If yes, then use of a computer program like **Crossword Magic** permits users to develop the aids with very little stress.

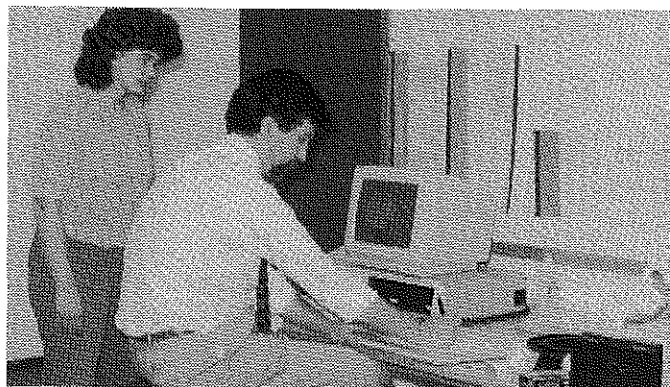
A similar strategy applies for the use of tutorials, games, and simulations. A good program has the potential for providing printed instructional material, an audiovisual aid, and a manipulative aid for student instruction. Insuring quality control is the major issue related to these types of programs. Before purchasing a \$50 textbook, most teachers review the quality of the book. The same must hold true for computer programs. The National FFA ACCESS program, vendor catalog reviews and descriptions, state teacher computer workshops, and discussion with other vocational agriculture teachers are all appropriate methods for determining if the software in question serves the teacher's purposes.

Electronic Information Retrieval

The amount of information impacting agriculture daily is most accessible and more manageable when electronic networks are utilized. Students and teachers go "on-line" to secure a vast array of information related to the agricultural education curriculum. Moore and Camp (1988) reviewed 10 on-line information systems including AgriData, the AgEd Network, AgriCola, AGNET, COIN, USDA online, Farm Bureau ACRES, Doane's Agricultural Computing, NPIRS, and Telplan. Generally, users are charged for system use, but most agree with Moore and Camp (1988) that the timeliness, currency and importance of the information probably offset the cost. On-line information systems open a new dimension for securing instructional materials. Information may be read at the computer terminal or down loaded to the teacher's computer system, saved, and printed for instructional use. On-line information systems become effective as instructional aids only after the teacher learns what is available on the system and determines how the information enhances instruction. If the information systems are to aid instruction, they must be used appropriately, just like a handout or transparency, to supplement instruction, not replace it.

Instructional Technology

The impact of technology on classroom instruction is not limited to microcomputer activities. Peter Martorella, Head of the Department of Curriculum and Instruction at North Carolina State University, indicated that, "Curriculum has not yet been transformed by the computer. However, computers have provided us with the ability to innovatively vary our instructional approach." (personal interview, April 28, 1988). Technology has provided teachers the luxury of interfacing the microcomputer with overhead projector liquid crystal display units, ceiling mounted projection units, 35mm cameras, video cameras, videocassette recorders, and videodisc players. These devices are useful for displaying instructional materials, developing instructional materials, and/or promoting student interaction with the instructional materials. Detailed information about most of these systems



The Polaroid Palette and data digitizing pad connected to a computer enables teachers to develop 35 mm slides of graphics, tables, or text for use in the classroom. (Photo courtesy of Barbara Malpiedi, N.C. State University.)

is available in the March 1988 issue of **THE AGRICULTURAL EDUCATION MAGAZINE**, "The Electronic Classroom." Slide production and interactive video need further discussion.

Slide Production

A great number of commercially available 35mm slide sets have been used as instructional visual aids by vocational agriculture teachers. To adapt the slides to the local area and to student needs, most teachers toss unapplicable slides out. Others will take their own slides and add these to the set. Producing slides of textual information has required taking a slide of the text. The printed information is usually photographed with a 35mm camera, and a variety of close-up lenses, mounted on a stand. The alternative is computer generated slides. Having used both systems, computer generated slides allow more color and graphic flexibility, are of higher visual quality, and are generally less frustrating to produce. One system requires the following components: an IBM computer with at least 640K of memory and color monitor; a data digitizer pen and pad; a 35mm camera like device, in this case the Polaroid Palette; Polachrome 35 film (most slide film works); and a software program called **Pen-pad** developed by Pencept. The user enters text via the computer keyboard and can create graphics or trace drawings on the digitizer pad. The camera is interfaced with the computer so that the created images are photographed upon command. The cost of the system is approximately \$1,700. If used frequently by a number of teachers and school staff, purchasing such a system is worthwhile.

Interactive Video

Over the past five years, a number of interactive video curriculum products have been developed. Most attempted to combine computer and videotape display capabilities. Fortunately, this method of producing instructional materials for vocational agriculture has become antiquated before being adopted. This does not mean that there are not appropriate instructional materials applications for video taping or even for video simulation as discussed by Atherton (1988). More effective laser videodisc and touch-screen technology loom on our horizon.

Interactive video merges computer and videodisc technologies. The goals of interactive video include: delivery of a consistent, quality message; self-paced instruction; and student interaction with immediate feedback. Students see

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and hear an instructional message. They must interact with the lesson. Usually the video frame freezes, text appears on the screen as video overlay, and students must respond in some fashion - type in information, press the letter of the correct response, or simply press any key if they are ready to move on. Good interactive video provides immediate feedback to the student and remediation if necessary. Laser videodisc technology allows immediate access to the instructional materials because the system is much faster than scanning through videocassette tape. To develop videodisc materials, the system requires a computer, a videodisc player (\$700 - \$2,500), the computer program disk, use of an authoring language, and communications hardware and software so that the computer and the videodisc player may be interfaced. The courseware is the laser disc which looks like a record album. Unless a teacher has a great deal of time and is also proficient in curriculum development, computer science, and laser technology, developing videodisc materials needs to be left to the specialists.

Interactive videodisc touch-screen technology has a great deal of potential for instruction in agricultural education. The IBM InfoWindow system is impressive from an instructional perspective. It is different from the previously discussed system in that the system must include the touch-screen monitor. For many students, it is less threatening for them to touch pictures or computer generated icons on the screen rather than worrying about the keyboard in response to items in the lesson. The monitor has dual speakers with stereo capabilities. On the average, one system (learning station) costs \$12,000. It is possible to connect the system to a computer projection unit facilitating classroom instruction.

Students use their sense of touch, sight, and hearing as they interact with the lesson delivered via this audiovisual, manipulative aid. Most of the available programs applicable to agricultural education include generic science or

mathematics programs, industrial technology programs - hydraulics instruction, safety, electronics, veterinary science diagnostics, etc. Courseware (in the form of a laser videodisc or series of discs) costs start at \$900 and may be as much as \$5000. The available IBM courseware products in one catalog have literally doubled in a year. It will not be long before agricultural educators can be very specific about the type of courseware needed to teach agriculture. However, if the price for these expensive instructional materials is to come down, there must be volume sales and application sharing targeted toward secondary and postsecondary students as well as other adult agriculturalists.

Methods of instruction employed by InfoWindow include lecture, illustrated lecture with support visuals, simulations, individualized study, and programmed instruction. Product research claims that students learn in 30% to 50% less time and retain 25% more information when using InfoWindow courseware as an instructional tool over conventional techniques. This remains to be tested by agricultural educators.

Summary

The computer has helped teachers develop instructional materials with greater speed and professional quality. Time, dollars, the audience, and quality control will influence the acquisition and/or development of instructional materials whether those materials are handouts or laser videodiscs. Regardless of the sophistication of instructional materials, the materials will always be used to supplement and complement the teacher's instruction. They should help make instruction more effective and definitely more exciting.

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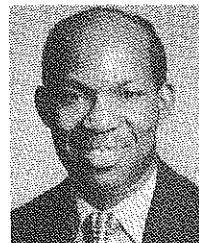
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THEME

Designing Instructional Programs For Special Populations

Futurists are predicting, based on input from industrial leaders, that the number one issue for the year 2010 and beyond will be equity. If they are also correct in predicting that equity in the work force for women and equity in general for children will top the equity chart, then now is the time for our educational system to start addressing this issue with those (students) who will be in the work force at that time.

There are many kinds of equity issues to be addressed: sex, race, age, economic, handicapped, political, and maybe others. Planners and leaders have "coined" the phrase "special populations" to address these groups. Our educa-



BY WILLIE J. RANDOLPH

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tional system is called upon to provide the leadership in defining the populous to be served and to identify corrective measures to be taken.

Our schools are trying to respond to the needs of as many populations as resourcefully possible. However, in their most sincere efforts to reach as many of these special groups as possible, our schools are having noticeable problems designing an effective instructional program to address these varying and specialized needs.

Through vocational education programs and other specialized efforts, some measurable instructional programs have been developed and implemented which appear to be making a difference in two of these areas, namely sex equity and equity for the disadvantaged and handicapped.

As a regional coordinator for vocational education, I have assisted two local education agencies to develop unique programs addressing the issue of sex equity and non-traditional career training for high technology occupations. I have also provided leadership in the development, coordination, and implementation of a multi-regional approach to addressing the same issue.

Progressive Avenues to Vocational Equity (PAVE)

This six-week summer program (PAVE) has as its objective to design an instructional curriculum that will introduce students to non-traditional careers in an effort to eliminate sex bias and traditional stereotyping. The core of instructional materials will be designed to reinforce theories and principles of high technology applied to concepts and practical problem solving in electricity.

More specifically, instructional materials are designed to accomplish these objectives: 1) to show students existing avenues for training and success in non-traditional technical occupations; 2) introduce students to "high-tech" fields such as robotics; 3) to provide relevant, related mathematics and science instructions to complement competencies taught in technical fields; and 4) to provide participants with introductory skills in drafting, electricity, computers, and robotics. The curriculum materials have a high degree of instruction in helping participants realize and overcome artificial barriers that might prevent males and females from entering training or work that was once considered only for a particular gender.

Participants from grades nine through eleven would be eligible to participate in this Technology Institute. They are exposed to 160 hours of instruction. Qualified instructors from the regular vocational programs are employed as teachers. Each participant who completes the program will receive one unit of credit toward graduation.

The participants rotate through four instructional classes each day with a maximum of 13 students in each time block. Instructional blocks include Orientation/Enlightenment/Remediation, Applied Physics/Math and Robotics, Electricity/Electronics, and Drafting. Flexibility of time allows for individualizing the instructional process to a particular participant's needs. An advanced curriculum is offered for participants electing to attend the institute for a second summer.

Specific curriculum and instructional materials are formally identified and designed once each participant has been counseled through a pre-assessment of career paths and future aspirations. A post-assessment is administered to determine attitudinal changes and any changes in career preference. Participants in the Technology Institute will be part of a special follow-up to determine the effectiveness of

the institute in encouraging participants to enter non-traditional careers.

The challenge to the developers of this program was twofold: 1) develop a curriculum package that would attract participants voluntarily back to the school setting during their vacation time; and 2) find and inservice an instructional staff that would be able to move from the traditional to the non-traditional and make the move an enjoyable adventure for the participants. It appears that the Robeson County Schools in Lumberton, North Carolina, met and surpassed the challenge. This program is planning its 3rd Technology Institute.

Future Advancement Toward Career Education (FACE)

This project designed its curriculum to aid students in grades eight through eleven. The primary focus of the curriculum is to identify and overcome obstacles based on sex biases and other historical stereotypical settings. A related goal is to guide the participants in this program into courses in the high school curriculum that have been in past years stereotyped by sex or other physically and mentally limited norms.

The purpose is categorized as short-term instruction because it operates for only four (4) weeks during the summer months (June and July). The program operates an 8-3 p.m. schedule, including lunch, which is provided through the summer school feeding program.

During the seven hours that the students are in attendance, they are exposed to a curriculum consisting of courses in health occupations, business and office, and leadership for the males. The females explore career choices in the areas of carpentry, electricity, small engines, and leadership.

Pre- and post-assessments are used to chart the relative gains each participant makes during his or her four weeks of exploratory experiences. This information is very helpful as each participant develops his or her educational plans for a successful matriculation through high school. Guidance counselors will use the assessment data in determining proper career paths to advise the participants to follow.

To supplement their classroom exploratory experiences, the participants take several field trips to businesses and industries which produce and/or services related to their classroom experiences. A primary focus of the field trips is to expose the participants to two specific elements in today's work force: 1) males and females working side-by-side in occupations that were once dominated by one sex; and 2) the use of technological advances that have turned what was once manual in nature into a sophisticated highly technical work environment. With a limit of 20 participants in the program, a number of field trips could be planned and managed with ease. Knowing that if the participants could see first-hand (through field trips) what is taught in the classroom makes curriculum offerings have more relevance.

Other objectives of the FACE program include: aiding students in identifying and overcoming obstacles based on sex bias; providing for increased employment in non-traditional industrial trades; increasing enrollment in non-traditional courses within the curriculum; providing for

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shadowing experiences in area businesses and industries; and providing counseling in the areas of work attitudes, barriers to employment, and self-image.

Summer Exploratory Program

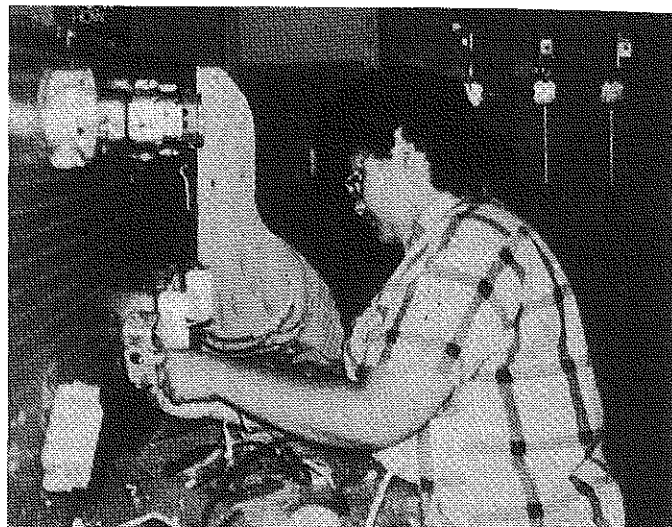
This program is a two-week summer technology camp. The curriculum affords students the opportunity to develop skills, awareness, and understanding of non-traditional careers in technological fields. Participants are selected seventh and eighth grade students with the majority being females.

The two-week camp, including one weekend, has six instructional objectives:

1. To assist students in appraising career opportunities in non-traditional objectives:
2. To provide opportunities for students to develop leadership skills through participatory activities and by being exposed to desirable role models.
3. To expose students to some areas of high technology where computers, robots, satellites, engineering, scanners, lasers, diagnostics, and high tech health and human services play a major role.
4. To expose students to a variety of activities which will enhance their cultural and academic mobility. This includes visits to educational exhibits, role playing, role models, and instructional activities.
5. To inservice the instructional staff in building scenarios with the participants as to what our society will involve in the year 2010.
6. To develop within the participants the ability to demonstrate:
 - a) Basic technological literacy
 - b) An awareness and understanding of careers in high technology
 - c) An awareness of role models in non-traditional fields
 - d) The ability for both women and men to constructively deal with barriers that may occur in non-traditional fields. This includes making informed and rational decisions as one works side-by-side with different ethnic groups and sexes.

The developers of this program believe that with the advancing of technology in areas such as genetic engineering, artificial intelligence, fiber optics, laser robots, space parts for humans and portable, powerful computers, there is definitely the need to prepare all school populations for this future. The traditional "four-walled" classroom approach is coming up short of this goal.

Sixty participants are chosen in a statewide selection process with input from organizations, such as the National Organization of Women, The Association of Indian People, schools, and Region "O" Council for the Advancement of Minorities in Engineering. This cooperative recruitment enhances the assurance of a balance in ethnic and



Female student exploring electrical wiring concepts and careers in electricity as part of the PAVE Technology Institute.

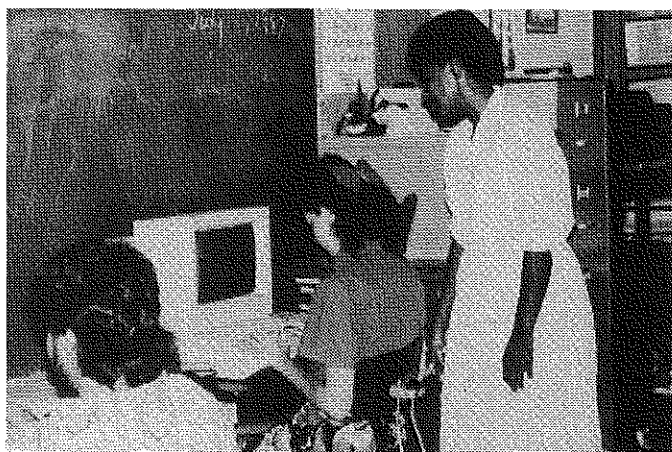
male/female participation. With funding from state grants and other organizations, there is little to no cost to the participants.

Using a camp setting and being able to house the participants at the campsite affords an excellent opportunity for the participants to enjoy an informal learning atmosphere as well as develop new friendships. The location and other activities of the campsite provide cultural enrichment as well as recreational leadership activities.

The participants are divided into four groups. Each group spends a portion of the day in the following 45-minute classes:

- **Guidance** - (non-traditional career counseling, manipulative skills, understanding one's self and potential impact on those around us)
- **Assertiveness/Leadership Skills** (parliamentary activities, role playing and outdoor activities)
- **Technical Skills Development** - (electronics/electricity, health and human services careers, computers and robotics)
 - Electronics/Electricity - overview, assembly of electronic kits, laser technology, fiber optics usage, electrical engineering, nuclear energy, circuits and silicon chips
 - Robotics - overview, usage, partial assembly
 - Computers - usage, literacy, basic language, and exposure to software packages
 - Health and Human Services - artificial intelligence and genetic engineering, spare parts for humans, non-aging drugs, Red Cross services and new birth technologies
- **Field Trips/Demonstrations** - (visits to industries, hospitals, agencies, military and on-site demonstrations of high technology concepts, and future possibilities).

The evaluations from this activity have been very positive with 89% of the participants and 95% of the staff saying they wish to participate another year. These positive evaluations have resulted in the approval for funding for future years.



Students exploring computer concepts and careers in computer science and computer applications in the PAVE Technology/Institute.



Utility company representatives demonstrate how the utility uses computers in the company's operations. This is part of the Technology Enhanced Summer Camp. (Photos courtesy of the author.)

THEME

Are You Getting The Most "Bang" For Your Agricultural Videotape "Buck"?

One dilemma agricultural educators have had to contend with over the years is the difficulty of keeping current in the area of technical agriculture. Advances in agricultural technology are rapidly influencing today's farms and agribusinesses. Experts (USDA, 1984) predict even greater changes will occur in the future:

"Today's agriculture is the product of increasing change over the years — change in the past 50 years probably exceeds the previous 100 years and each decade brings greater change from the one before. Much of the change in recent years has resulted from closer ties to general economic developments and policies here and abroad. Further significant change is expected in the next decade because of ever changing global economic conditions; rapid technological advances, which likely will bring growth in production capacity and shifts in demand for agricultural products; and a growing dependence of U.S. producers on increasingly competitive world markets."

Textbooks are the traditional instructional medium utilized in public schools. Boyer (1983, 143) argues that many textbooks "present students with a highly simplified view of reality and practically no insight into the methods by which the information has been gathered and facts distilled." In this national report, Boyer concludes that richer instruction can be provided by expanding the use of original sources in the classroom. Agricultural videotapes offer tremendous potential for enriching instruction.

The videotape recorder, player, and video monitor have become increasingly popular in vocational agriculture departments across the country. As a result of this popularity, commercial production of agricultural videotapes has increased tremendously over the past 10 years. In response



BY MATT BAKER AND ROGER ROEDIGER

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to this growing market, the Curriculum Materials Service (CMS) at The Ohio State University recently completed an extensive review of agricultural videotapes available. As one might expect, significant differences were found in the quality and price among vendors. The purpose of this article is to present a set of criteria which vocational agriculture teachers might want to consider prior to purchasing agricultural videotapes.

Purchasing Agricultural Videotapes

The price of agricultural videotapes ranges from under \$20 to over \$120 per tape. It is apparent that the purchase of videotapes constitutes a major long-term investment in the overall departmental budget. It is important that vocational agriculture teachers, whenever possible, examine the

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videotapes prior to purchasing them. Vocational Agriculture teachers have several options in regard to previewing agricultural videotapes.

First, some vendors will loan complete videotapes for previewing purposes. This poses a risk to the vendor because of the ease with which videotapes can be copied. Therefore, not many vendors provide this service.

Second, some vendors have demonstration videotapes with short clips of several of their offerings on one tape. Demonstration videotapes generally present the "best" of the videotapes represented. They may not be truly representative of each individual videotape.

A third opportunity for vocational agriculture teachers to preview videotapes is to visit vendor booths at conventions and state inservice education programs. Many vendors attend such shows and have sales representatives on hand to answer teachers' questions.

Fourth, a significant proposal is for vocational agriculture teachers to make appointments (so that arrangements can be made to have monitoring equipment on hand at the time of the visit) with the nearest state curriculum materials service to preview the videotape on location. Many state curriculum materials services offer videotapes produced by various commercial vendors.

A final method vocational agriculture teachers can utilize to preview videotapes prior to purchase is to visit neighboring vocational agriculture departments which have purchased the videotapes and preview them with a fellow teacher.

Previewing Videotapes

What should vocational agriculture teachers look for when previewing agricultural videotapes? The following criteria might be helpful in answering this question.

1. Is the content technically accurate?

In the CMS video review, most agricultural videotapes were found to be on target; (technical agricultural specialists were included in previewing the videotapes for content accuracy). There were some videotapes, however, that were identified as containing errors in the technical information presented. When a teacher is not well versed in a specific content area, someone who has expertise in the area could be asked to preview the videotape with the teacher.

2. Is the content appropriate for the local curriculum?

Local vocational agriculture departments differ tremendously. Different communities have differing expectations of what should be taught in their respective communities. Tapes must be selected with caution so that they "fit" the local curriculum.

3. Could the content be presented more effectively or efficiently by some other media?

Videotapes are not the panacea that many believe. There are still those topics that are more appropriately presented with colored slides, still pictures, or printed handouts. It is difficult to stop a particular frame of a videotape and have a clear illustration to point out.

4. Are the objectives of the content evident and clear?

Quality instructional methods are the same whether one is teaching with a videotape or lecturing in front of the classroom. Not all videotape vendors have done a good job in utilizing appropriate pedagogical practices. Learning is enhanced when clear objectives are presented at the beginning of the videotape and reviewed at its conclusion.

5. Are occupational or personal competencies developed as a result of viewing the videotape?

Teaching with the use of videotapes should be lesson centered and taken seriously as a viable aid to instruction by students and teachers alike. All types of instructional materials can be abused if misused.

6. Is the level of the videotape appropriate for vocational agriculture students?

Many videotapes on the market are produced with adult learners in mind. Viewing videotapes that are presented above or below the learning level of the student can be a very frustrating experience.

7. Is the photography clear and in good focus? Is the color appropriate?

Color is an important assurance of reality. For instance, teaching quality grading of meats would be almost impossible if the color is not accurate and well defined. One of the major criteria for quality grading is muscle color.

8. Is the sound interesting and pleasing?

Sound is essential to maximum clarity. Many videotapes are produced in the field setting. It is very distracting for the learner if the background sounds of livestock and/or machinery prevent clear understanding of the person presenting the subject matter.

9. Is the presentation interesting and pleasing?

Unfortunately, many individuals with technical competence in agriculture are very poor communicators. Quality videotape producers are cognizant of this fact and present the material in such a way that the best possible communication results.

10. To what extent does the presentation motivate the viewer and encourage active learning?

Obviously, a videotape which provides practice classes which show carcasses for livestock evaluation, or plants for identification encourages active learning. Some videotapes also provide quizzes after certain sections. If quizzes are included, students may need to be provided a hard copy of the quiz to compensate for differences in student reading levels.

Final Comments

There are a few other important considerations vocational agriculture teachers should remember when purchasing agricultural videotapes.

First, look for videotapes that feature speakers who do not use sexist phrases. Producers of agricultural videotapes should be sensitive to the need to avoid such sexist terminology such as "Ag boys."

Second, do not be guilty of illegally copying agricultural videotapes. Significant costs are involved in the production of these videotapes. Teachers who illegally copy videotapes not only violate the law, but also place an additional burden on all vocational agriculture teachers. Illegal duplication im-

pacts other teachers in at least two ways. The companies must increase their prices to compensate for such action. And if the company does not realize a profit, it may be forced out of producing agricultural videotapes altogether.

Third, whenever possible, purchase videotapes from reputable producers who have kept pace with technology. Such companies are sincere in attempting to produce quality videotapes. Their representatives are generally responsive to teachers' needs and suggestions for improvement.

Fourth, beware of "free" or relatively inexpensive videotapes which are highly commercialized for a particular agribusiness. These videotapes often have very little potential for a significant contribution toward student learning.

Fifth, do not forget your local Cooperative Extension Service. Most state Cooperative Extension Services invest a great deal of money in videotape production.

The final suggestion involves the need for the vocational agriculture teacher to visit with fellow teachers and find out what they are using. Teachers should not be hesitant to ask their state supervisors or teacher educators for recommendations regarding any type of instructional technology.

Agricultural videotapes have much to offer in terms of enhancing and enriching instruction. They should be considered as a long-term budget expenditure. Time carefully invested in planning prior to purchasing videotapes can make a significant contribution to quality instruction in a vocational agriculture department.

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- Boyer, Ernest L. (1983). *HIGH SCHOOL: A REPORT ON SECONDARY EDUCATION IN AMERICA*. New York: Harper and Row, Publishers, p. 143.
- United States Department of Agriculture (December 1984). *AGRICULTURE IN THE FUTURE: AN OUTLOOK FOR THE 1980'S AND BEYOND*. Agriculture Information Bulletin Number 484.

THEME

Keeping Each Learner On The Cutting Edge

In October, shocks of corn appear on many elementary school bulletin boards across the United States. This scene depicts a child's view of the food chain and the agricultural harvest. Yet, yesterday's image gives way to today's quick-drying hybrids, high capacity combines, and labor saving storage facilities. These technical changes have occurred throughout the industry as a result of the adoption of applied research.

As teachers, have we adopted innovations to keep the instructional program up with industry advances? Research has demonstrated that published instructional materials can contribute to instructional quality. Porter and Brophy (1988, p. 80) conclude, "If teachers carefully select instructional materials to fit the curriculum goals and the characteristics of their students and then make extensive use of these materials, they will be able to devote most of their time and energy to practices that enrich the content . . ." Instructional materials can multiply the efforts of teachers and improve the understandings and performances of learners. How can we, as teachers, select and manage instructional materials which improve the quality of both teaching and learning in the laboratory?

Identify Important Subject Matter

Subject matter must be relevant and congruent with the purposes of instruction. In agricultural mechanics, there are a number of research studies to indicate the importance of specific competencies and the frequency with which specific tasks are performed in the workplace. These data are beneficial but the best information may come from local sources. A discussion and review of instructional goals and



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objectives with advisory committee members will be valuable as a stimulus for both program improvement and public relations.

The understandings and performances in BULLETIN NUMBER 4, 1988/1989/1990 is an excellent initial listing of competencies. This updated list is the result of a long-term analysis of the National Agricultural Mechanics Committee and is subject to periodic review by national industry leaders.

Sequence the Learning

Instructional materials should provide the organization and sequence for learners to assimilate basic principles and develop advanced subject matter competencies. The learning theories of Jerome Bruner and John Dewey can help provide both structure and sequence. Simply, Bruner recommends learning begins by making a connection between the experience of the learner and the subject matter. Following this tie, the knowledge base can be developed by incorporating facts about the subject.

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Keeping Each Learner On The Cutting Edge

(Continued from page 17)

Advanced learning will include abstract reasoning after the student has problem-solving maturity. As teachers, we recognize the importance of sequence in performing subject matter tasks such as disassembly, inspection, repair, and reassembly of a hydraulic pump. However, we often overlook the importance of sequence in learning about such tasks. Sometimes a simple taxonomy listing will communicate to the learner how the lesson fits into the overall instruction.

Course: Vocational Agriculture 311

Unit: Agricultural Mechanics

Problem Area: Agricultural Power and Machinery

Problem: Hydraulic Systems

Job: What materials and techniques are necessary to service the open-center hydraulic system of specific machines?

Date: October 31, 1988

Establish Purpose for Learning

The current and anticipated needs of agricultural industry focus the selection of subject matter content. The direction of learners, however, comes from teacher input and instructional materials. Textbooks and reference materials should be matched to individual needs such as reading level or experience. When used to develop the knowledge base, students will have a view of how specific competencies fit into real-life situations. Begin by identifying the existing experiences of the learner. Tie these experiences to the planned laboratory activities. This part-to-part-to-whole connection is essential if the learner is to value the laboratory activity and do quality work.

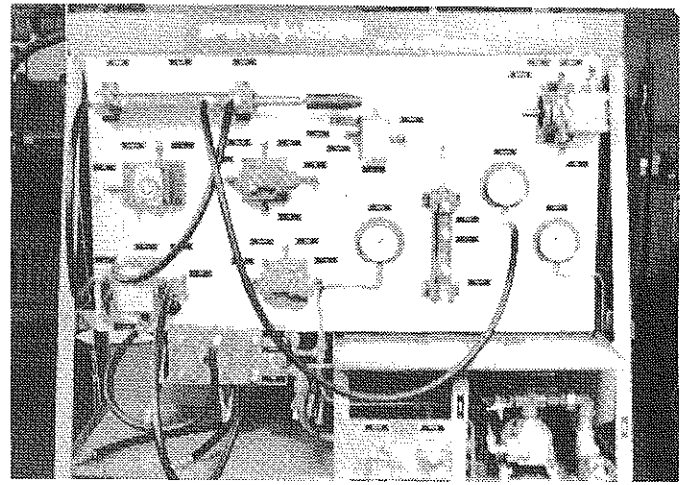
Apply Skills

Instructional materials can provide the structure and diversity for learning while allowing a teacher to effectively manage several activities. Within each lesson, individual students have many different reasons for learning (or not learning). The student who has an interest in production agriculture may view hydraulics as a two-way cylinder to lift heavy loads while the student with experiences in landscape construction sees hydraulics as the drive motor for the new reel mower. Instructional materials should have the flexibility to provide each student with simulated practice congruent with their expertise, abilities, and aspirations.

Provide Differential Activities

Instructional materials provide the baseline activities for all students. These materials develop the concepts and principles necessary to perform competencies identified by industry studies. However, students have individual needs and abilities.

Effective instructional materials can provide enrichment activities for high achieving learners. There may be subtle differences in the materials such as the level of mathematics or physics required for problem solving. High ability



This simulator/trainer provides an overview of the hydraulic system found on agricultural equipment. Instructional materials which simulate actual systems are effective for both enactive and iconic learning stages.



Sequenced learning is just as critical as sequenced disassembly of complex components. Learning must begin by tying the experiences of the learner with the reasons for learning. Textbooks and operator's manuals provide some sequence for learning.

students may be involved in completing a maintenance program for a fleet, calculating cost estimates for specific jobs, or testing materials for strength and durability.

At the same time, other instructional materials can provide remediation for learners with special needs who have not yet mastered the baseline competencies. Remediation may include a re-teaching loop with additional practice or special aids to compensate for learning styles or reading, mathematics, or psychomotor limitations.

Provide Clear Procedures

The steps in completing the performance are important components of instructional materials. The procedures may review basic principles, provide or collect necessary data, point out special considerations or hazards, and sequence activities for the learner. Advanced students may be required to develop the procedures prior to performing the activity. One of the important responsibilities in today's instructional program is to encourage learners to begin to teach themselves.

Evaluate the Learner

Research on learning has demonstrated the value of connecting evaluation with objectives and performance. The closer the corrected feedback and knowledge of results, the more likely the performance will improve. Instructional materials should provide detailed evaluation criteria. This will provide the opportunity for each learner to evaluate his/her work. The criteria make a direct connection between performance objectives and performance outcomes. The quality of work improves when the learner has the opportunity to compare his/her work against a standard.

The independent evaluation by the teacher should be compared to the evaluation by the learner. If differences occur within criteria or in total score, the teacher should discuss them with the learner and redefine quality work. In a rapidly changing agricultural industry, there is need to develop a system which encourages the learner to identify evaluation criteria and accurately evaluate his/her own work. This evaluation should focus on product quality, process skills, safety, and good work habits of the learner.

Summary

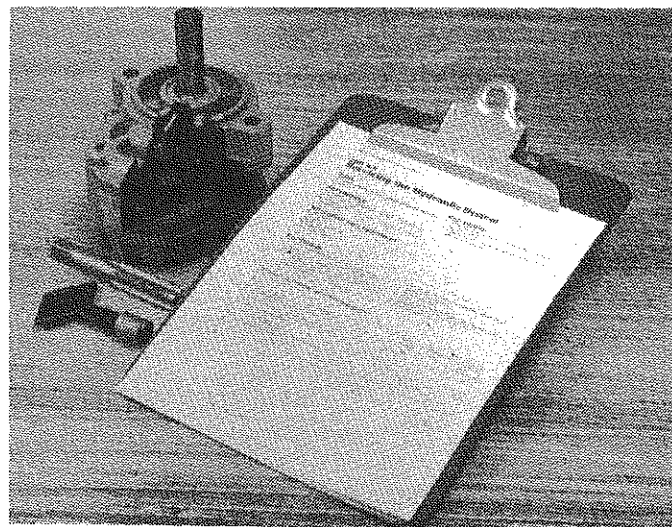
Effective instructional materials increase student learning and reduce the amount of teacher time required for student direction. The materials should sequence important competencies and encourage the learner to master each step through progressive reinforcement. By establishing a genuine purpose for learning, the student is more likely to transfer the new skills to real-life settings. But perhaps the most important feature is to develop students' ability to judge the

quality of their work and encourage them to stay on the cutting edge of learning.

References

National FFA Center (1987). BULLETIN NUMBER 4, 1988/1989/1990. Alexandria, VA 22309.

Porter, A.C. and Brophy, J., (1988). "Synthesis of research on good teaching: Insights from the work of the institute for research on teaching." EDUCATIONAL LEADERSHIP. Vol. 45, No. 8.



Instructional materials provide directions for the learner, yet require very little teacher time to manage. The Job Sheet should identify the goals, outline the procedures, and provide a scorecard for evaluation of quality work. (Photos courtesy of the author.)

THEME

Instructional Materials: A Key to Technology Transfer

The strengths of agricultural education programs have traditionally been dependent on the willingness, capabilities, and commitment on the part of local people to have the best possible programs. Local agricultural education teachers have played very significant roles in planning, implementing, and evaluating high quality programs. Needless to say, local professional staff (administrators, other teachers, counselors, librarians, etc.) and outside groups, including state staff and university personnel, have also assisted teachers in offering agricultural education programs of national stature. However, the challenges facing agricultural education (including technology transfer) will undoubtedly require in-depth study, debate, and formulation of proposals for policy and program changes.

These processes should provide the foundation for new and innovative programs in agricultural education. The agricultural education profession must accept the challenge of responding to a vastly changing society due to global events and issues. In some communities, agricultural education programs which are science, business, and international-



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ly focused may very well be the only alternative if they are to remain viable components of local educational systems. The leadership for new initiatives, program redirection, and revitalization should come from local agricultural education teachers. If we are to offer new and innovative programs that are responsive in nature, we will need to give a high priority to a number of programmatic thrusts including the selection of high quality instructional materials. The points to follow should be considered.

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Instructional Materials: A Key to Technology Transfer

(Continued from page 19)

Key Points

1. **Take an inventory of available instructional materials.** First and foremost, one should take an inventory of available instructional materials for teaching agricultural education. Most of the instructional materials are probably in the agricultural education department and/or the school's resource center. An appropriate format (title, date, content area, etc.) should be designed for taking inventory and could be categorized as following:

- | | |
|--------------|-----------------------|
| a. Books | f. Slides |
| b. Bulletins | g. Charts |
| c. Magazines | h. Audio Visual Tapes |
| d. Journals | i. Filmstrips |
| e. Films | j. Specimens |
| | k. Other |

2. **Decide what should happen to instructional materials which are not of high demand.** While certain instructional materials may not be of high demand, a thorough discussion relative to what should be done with these materials would be appropriate. It is conceivable that an initial discussion session that involved the agricultural education teacher, principal, and the resource center staff should be held. A number of good ideas will probably surface during the meeting. One idea which seems to be appropriate would be to establish a location in the school titled, "Historical Agricultural Information." Appropriate, low demand instructional materials could be kept for further use.

3. **Review and up-date the filing system for instructional materials.** Based on the rapid changes in agriculture as well as more advanced storing and retrieval systems, a careful review of the current filing system should be given a high priority. An initial discussion session with the school's librarian may prove to be very helpful in designing and installing a very useful filing and retrieval system. A major consideration should be on the curriculum content to be taught including new and emerging topics such as:

- a. Agriculture in the classroom
- b. Agricultural science and technology
- c. Agricultural business
- d. Computers in the classroom
- e. International agriculture.

4. **Secure catalogs of possible resource materials.** Interestingly enough, there is an abundance of instructional materials available for teaching agricultural education. These materials are available from universities, government, and the private sector. The challenge is to allocate the time necessary to review the materials and purchase those appropriate for the local situation. An initial step could be to see what materials are available from the land-grant university or other appropriate universities in the state. Some agricultural and extension education departments have maintained very good instructional materials services. Most of the materials which are available have been developed and/or reviewed by agricultural education teachers. Catalogs of materials developed at other agricultural education instructional materials services are probably available for review. In land-grant universities, one is also apt to find

some of the most up-to-date technical agriculture information which is normally distributed by the Cooperative Extension Service. State Departments of Agriculture, the U.S. Department of Agriculture, Soil Conservation Service, and other governmental agencies have excellent materials for teaching agricultural education. Many publishers, Councils, Boards, and Societies also have excellent supplemental teaching materials. Faculty who are responsible for preparing agricultural education teachers could assist one in locating the addresses for the groups mentioned.

5. **Consider the need for instructional materials and preview those which may be purchased.** Due to an abundance of agricultural education instructional materials, one should carefully assess the need (content to be taught, abilities of students, etc.) for additional materials in light of possible financial support. Obviously, new and emerging topics should be given a high priority if one is going to prepare students for a rapidly changing economy. Most agencies, organizations, and businesses are likely to loan their materials to teachers for previewing.

6. **Submit request for purchasing additional instructional materials.** To increase the chances of approval, it seems appropriate to determine procedures and processes for submitting requests for purchasing instructional materials. This may include discussing the need with key decisionmakers (department chairperson, principal, vocational director, superintendent) prior to submission. Prior to such discussions, it is appropriate for one to develop a rationale, list content areas to be taught, instructional materials needed, and cost. This type of information should assist the teacher and the key decision-maker in having a very meaningful discussion session relative to this important request. Remember that most school districts are likely to have more dollars available at the beginning of the fiscal year than at the end. However, one should not overlook year end dollars which must be spent prudently. Once initial approval has been granted, specific ordering information should be forwarded to the purchaser.

7. **Check materials upon arrival and file.** When materials arrive they should be checked immediately for content and damages. Adhering to this important step will eliminate many problems including grace periods for returning damaged products.

8. **Update the filing and retrieval system annually.** At the end of each year, the filing and retrieval system for instructional materials should be updated. This may include removing some materials from the system and purchasing others.

Summary

Agricultural education programs must continue to respond to a variety of challenges. The challenges may consist of a larger enrollment of non-traditional students, new and innovative programming thrusts, and more focused curriculum (science, business, international agricultural education, etc.) to respond to local and global needs. Careful selection of high quality instructional materials will be crucial as we attempt to respond to a variety of challenges. Technology transfer and understanding will become a major focus of our future efforts in agricultural education. Therefore, all of us in agricultural education should recommend ourselves to the development, distribution, procurement, and appropriate use of high quality instructional materials.

U.S. Agricultural Commodity Statistics - Current Series

Many thousands of publications are issued annually by U.S. government agencies, but many U.S. citizens are not aware that they exist. Some publications are required by law, some are reports of research, and some contain general information on various subjects. Most are intended for the general public, but some are technical in nature and of greatest value for the specialist. All are the output of government bureaus, agencies and researchers working for the government.

A large number of agricultural related publications are currently being issued. Unfortunately, many of those involved in agriculture and farm management are not aware that government produced information is available to them, often at their local libraries.

The federal government had established a program in which governmental information is provided at no cost to the public, through libraries. This is known as the Federal Depository Library Program. Around 1,450 of these depository libraries exist, some in every congressional district. Over 6,000 different government series are available to be selected for the collections of the depository libraries. The number of series selected by a library will depend on the need of the local clientele and the need of the geographic area in which the library is located. The U.S. Department of Agriculture issues over 570 series by itself. It is a sampling of these publications on which this article focuses.

A person seeking a government publication which may not be available in a local library can borrow it from Regional Depository Libraries which are located in almost every state. Their collections include all 6,000+ government depository series. A local library's Interlibrary Loan Service can arrange for these loans. The Regional Depository System is another way in which citizens are provided ready access to governmental information, although it may not be available locally.

This bibliography covers major agricultural commodity publications issued by any of the following five government agencies within the U.S. Department of Agriculture (USDA): Agricultural Marketing Service (A 88); Bureau of Agricultural Economics (A 36); Economic Research Service (A 93); Economics and Statistics Service (A 105); and National Agricultural Statistics Service (A 92). The organization of this article is in the following subject groupings: general; field crops (including cotton); fruits and nuts; livestock, dairy and poultry; vegetables; miscellaneous commodities; and prices and yield.

The letters and numbers in parentheses following the annotation is the Superintendent of Documents classification number. It is a standardized numbering system used by many depository libraries to arrange U.S. government documents on shelves. The number in the brackets is the

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item or series number. It is a control number for depository libraries. Both of these numbers can help depository librarians identify publications for users.

General

Agricultural Economics Research, v.1, 1949+

Quarterly containing economic and statistical research papers by governmental bureaus and cooperating agencies. Papers usually include charts, statistics, and bibliographies. (A 93.26: — See also A 88-27: and A 105.21:) (Item 0018).

Agricultural Outlook, # 1, 1975+

Monthly analysis of factors affecting the U.S. food and fiber economy. Covers inter-related developments and potential impacts upon agriculture and consumers. Text, charts, and statistics. Includes some time series. (A 93.10/2: — See also A 105.27:) (item 0042-M).

Agricultural Statistics, 1936+

Annual compilation of the most important series of statistics concerning agriculture and related subjects. Includes time series for the past 10 years. (A 1.47:) (item 0001).

Census of Agriculture, issued by U.S. Bureau of the Census.

Census was taken every 10 years from 1840 through 1950. Five year census were begun in 1925. The 1950's schedule was changed to every five years for the years ending in "4" and "9". Congress authorized the census to be taken in 1978 and 1982. The most recent agriculture census was taken in 1987 and publications will be issued beginning in the Fall of 1988. There are three major groupings of statistics: state data, county data, and U.S. summary information. The "Table of Contents" or "front end sheet" of the census volumes should be used as an index to the various tables. Includes some time series for the past 10 years. (C3.31/4:) (item 0151-A-01 to 0151-A-40).

Crop Production, Acreage, 1983+

A 92.24/4-2:) (item 0020-B-02).

Crop Production Annual, 1971+

Crop summaries in maps, statistics, and text. Gives weather reviews, acreage, yield and production summaries. Includes time series. (A 92.24/4:) (item 0020-B-02).

Crop Production, 1941+

Monthly; contains similar information as annual. (A 92.24: — See also A 88.24: and A 105.9:) (item 0020-B).

Farmline, v.1+ , 1980+

(Continued on page 22)

U.S. Agricultural Commodity Statistics - Current Series

(Continued from page 21)

Monthly periodical written in a popular style. Has articles and reports analyzing "trends in farm production, foreign trade, commodity prices, land use and land values, farm finances, rural population and employment, productivity policy and other subjects." Text with some charts. (A 93.33/2: — See also A 105.10/4:) (item 0019).

Foreign Agricultural Trade of the U.S., 1962+

Earlier title, **Foreign Agricultural Trade.**

Covers agricultural exports and imports by commodity or commodity and country. Gives quantity and value. Brief text and extensive statistics. Include time series. (A 93.17/7: — See also A 105.14:) (item 0042-E).

Foreign Agricultural Trade of the U.S., Fiscal Year, Supplement.

Annual. (A 93.17/7-2:) (item 0042-E).

U.S. Foreign Agricultural Trade Statistical Report, Calendar Year. (a Supplement to Foreign Agricultural Trade of the U.S.) 1971/72+

Gives current and historical information on U.S. foreign trade with statistics covering commodity and country. Includes "value, quantity and principal markets for agricultural imports and exports." (A 93.17/3: — See also A 67.19/2: and A 105.14/2:) (item 0042-E).

World Agricultural Supply and Demand Estimates, #1, 1980+

Covers wheat, rice, coarse grains, corn, soybeans, cotton, sorghum, barley, oats, beef, pork, broilers, turkeys, and eggs with assessments of developments for these commodities. Statistics and some text. (A 93.29/3:) (item 0011-F).

Field Crops (Including Cotton)

Acreage, 1976+

Covers corn, sorghum, feed grains, all wheat, food grain, cotton, and oilseed and reviews the planting process and weather. Text and statistics. Includes some time series. (A 92.39: — See also A 105.36:) (item 0020-B-04).

Cotton & Wool Situation and Outlook Report, #1+, 1975+

Superseded **Cotton Situation and Wool Situation.**

Issued twice a year. Major part deals with the textile and fiber aspects of cotton, wool, and mohair of U.S. and foreign industries. Manmade fibers are also discussed. Tables deal with cotton as a crop. Text, charts & statistics. (A 93.24/2: — See also A 105.16:) (item 0021-M).

Feed Outlook & Situation Yearbook, #1, 1939+

Earlier title, **Feed Situation.**

Covers corn, sorghum, barley, oats and hay — their supply, use, industrial & feed demands, and world situation. Text and statistics. Includes time series. (A 93.11/2: — See also A 88.18/2: and A 105.20/2:) (item 0021-E).

Rice Outlook & Situation Report, #1, 1926+

Earlier title, **Rice Situation.**

U.S. and world outlook in text and statistics. Includes time series. (A 93.11/3: — See also A 36.120:, A 88.18/18:, and A 105.20/24:) (item 0021-P).

Small Grains Annual Summary & Crop Winter Wheat & Rye Seedings, 1984/85+

Acreage, yield, and production for specific states and U.S. in general for wheat, oats barley, and rye. Text and statistics. Includes time series. (A 92.42:) (item 0122-A-06).

Wheat Outlook & Situation, + #1, 1936+

Earlier title, **Wheat Situation.**

Text and statistics for wheat acreage and flour, covering production, trade, markets, and price. Includes some time series. (A 93.11: — See also A 36.86:, A 88.18/8:, and A 105.20/3:) (item 0021-1).

Fruits and Nuts

Fruit Outlook & Situation Reports, #1, 1937+

Earlier title, **Fruit Situation.**

Text, charts, graphs, and statistical reports give quarterly reviews for noncitrus, citrus, berries, and tree nuts. (A 93.12/3: — See also A 36.99:, A 88.12/7:, and A 105.11/2:) (item 0021-K).

Noncitrus Fruits & Nuts, 1981/82+

Annual publication for the following fruits: apples, apricots, avocados, bananas, cherries, cranberries, dates, figs, grapes, kiwifruit, nectarines, olives, papayas, peaches, pears, pineapples, pomegranates, prunes, plums, and California dry fruits. Information on the following nuts: almonds, filberts, macadamia nuts, pecans, pistachios, and walnuts. Covers production, value, and utilization with information for specific states and U.S. as a whole. Includes some time series. (A 92.11/2-2: — See also A 105.11:) (item 0122-A-04).

Livestock, Dairy and Poultry

Cattle Inventory 1976+

Inventories for cattle and calves. Text, charts, and statistics. (A 92.18/6-2: — See also A 105.23:) (item 0021-N).

Cattle on Feed, 1963+

Earlier title, **Cattle and Calves on Feed.**

Monthly publication covering cattle and calves on feed for the slaughter market. Text, charts, and statistics. (A 92.18/6: — See also A 88.16/6: and A 105.16:) (item 0021-B).

Dairy Outlook & Situation, #1, 1931+

Earlier title, **Dairy Situation.**

Covers production, prices, and trade for milk and dairy products. Text, statistics, and charts. Includes some time series as well as foreign trade and trends. (A 93.13: — See also A 88.14/9: and A 105.17/2;) (item 0021-B).

Dairy Products, 1972+

Monthly; contains similar information to annual. (A 92.10/7: — See also A 105.17/3:) (item 0024-F).

Dairy Products Annual Summary, 1977+

Earlier title, **Production of Manufactured Dairy Products.**

Covers manufactured dairy products (butter, cheese, ice cream, dry milk, etc.). Text, statistics, and charts. (A 92.10/5: — See also A 88.14/10: and A 105.17/4:) (item 0024-F).

Livestock & Poultry Outlook & Situation, #1+, 1981+

Quarterly covering hogs, sheep and lambs, cattle, eggs, broilers, and turkeys. Text, charts, and statistics. Includes time series. (A 93.46:) (item 0024-C).

Livestock Slaughter, 1978+

Earlier title, **Commercial Livestock Slaughter and Meat Production**.

Monthly; contains information similar to annual. (A 92.18/3: — See also A 88.16/9; and A 105.23/4:) (item 0024-J).

Livestock Slaughter, (annual) 1959+

Earlier title, **Commercial Livestock Slaughter**.

Annual summary covering slaughter of cattle, calves, hogs, sheep and lambs, and red meat production for beef, veal, pork, lamb, and mutton. (A 92.18/3: — See also 88.16/17: and A 105.23/4-2:) (item 0024-J).

Meat Animals, Production, Disposition & Income, 1975/77+

Annual covering cattle and calves, hogs and pigs, and sheep and lambs. Text and statistics by state. (A 92.17: — See also A 88.17/3:) (item 0024-H).

Milk Production, 1961+

Earlier title, **Dairy Production**.

Monthly covering production of milk and grain concentration rations fed to milk cows for U.S. and each state. Text, charts, and statistics. Includes time series. (A 92.10: — See also A 88.14/2: and A 105.17:) (item 0024-F).

Sheep & Goats, 1985+

Annual statistical inventory with brief text for number and value of sheep and goats with information on specific states and U.S. totals. Includes time series. (A 92.18/8: — See also A 88.16/14: and A 105.23/8:) (item 0021-N).

Vegetables

Celery, 1981+

Monthly informational sheets covering plantings from selected areas. Includes time series. (A 92.11/10.4: — See also A 105.24/4:) (item 0024-E).

Mushrooms, 1981+

Annual information sheets of text and statistics for U.S. and state production and value of mushrooms. Includes time series. (A 92.11/10-5:) (item 0024-E).

Potato Stocks, 1982/83+

Quarterly informational sheets with charts, text, and statistics covering production, stocks, and processing of potatoes for U.S. and states. Includes some time series. (A 92.11/11: — See also A 88.12/9: and A 105.24/5:) (item 0020-B-01).

Potatoes & Sweet Potatoes, 1979/80+

Annual covering acreage, yield, production, disposition, utilization, and value for U.S. and specific states. Brief text with statistics. Includes time series. (A 92.11/4: — See also A 88.12/19:) (item 00220-B-01).

Vegetable Outlook & Situation, #1, 1937+

Earlier title, **Vegetable Situation**.

Covers fresh vegetables, (e.g., lettuce, tomatoes, onions); processed vegetables (eg. peas, corn, beans, tomatoes); potatoes, sweet potatoes, mushrooms, dry beans & lentils. Text, charts, & statistics. Includes time series. (A 93.12/2: — See also A 36.100:, A 88.12/8:, and A 105.24:) (item 0021-L).

Vegetables, Processing Annual Summary, 1984+

Earlier title, **Truck Crops**.

Covers production, value, and crops of (1) principal fresh market vegetables and melons (celery, sweet corn, honeydew melons, lettuce, onions, tomatoes, asparagus, broccoli, carrots, cauliflower and strawberries), and (2) processing crops' area, production, value (principal crops: snap beans, sweet corn, cucumbers, green peas and tomatoes). Information in text and statistics for specific states and U.S. in general. Includes time series. (A 92.11/10: — See also A 88.12/6-2:V52/2) (item 0024-E).

Vegetables, 1977+

Monthly in two sections: fresh market and processing. A 92.11: — See also A 105.24/2-2:) (item 0024-E).

Vegetables Fresh Market Annual Summary, 1976+

Earlier titled, **Truck Crops**.

A 92.11/10-2: — See also A 88.2:V52, A 88.12/6-2:V52/2, and A 105.24/2:) (item 0024-E).

Miscellaneous Commodities

Aquaculture Outlook & Situation, #1+, 1981+

Contains texts, statistics, and charts for catfish, trout, and crawfish. Includes some time series. (A 93.42: — See also A 105.23/2-2) (item 0024-C-1).

Floriculture Crops: Production Area & Sales, 1965+

Earlier title, **Cut Flowers, Production and Sales**. A 92.32: — See also A 88.47:) (item 0024-L).

Oil Crops, Outlook & Situation Yearbook, #1, 1983+

Earlier title, **Fats & Oil Outlook & Situation**.

Covers soybean, cottonseed, peanut, flaxseed, sunflower, coconut, corn, etc., as well as other oils such as lard. Text and statistics. Includes time series. (A 93.23/2: — See also A 93.23:) (item 0021-D).

Prices and Yield

Agricultural Prices, 1942+

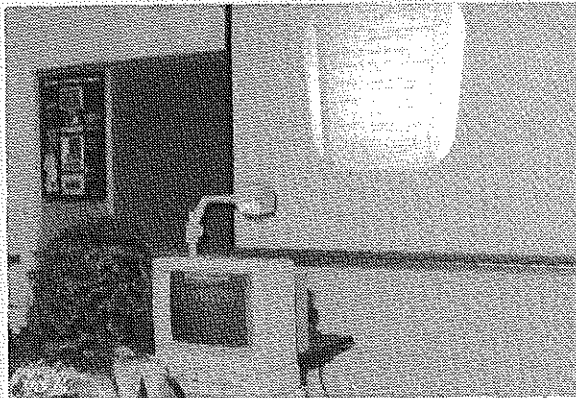
Monthly with charts and tables of prices received and paid by farmers. Also includes information for commodity groups, e.g., field crops or livestock and specific commodities like corn or cattle. (A 92.16: — See also A 88.9/3: and A 105.26:) (item 0018-C).

Conclusion

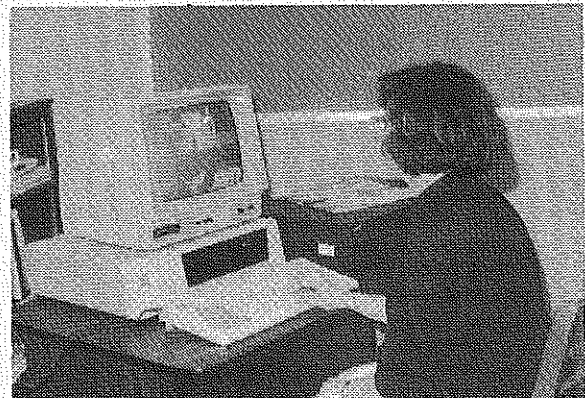
There are many publications available from the U.S. Department of Agriculture with information on agriculture commodity statistics. This article has listed forty-three current series which are available in depository libraries throughout the nation. It is hoped that many of them are being consulted by practitioners in agriculture. However, some series may be unknown and therefore overlooked. It is anticipated that this article will help agronomists become more aware of commodity statistics that are being issued by the USDA, and that they will seek this information by contacting a depository library in their local area.

Stories In Pictures

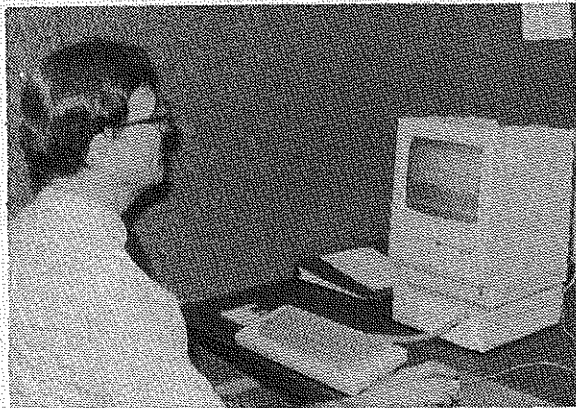
Computer Generated Instructional Materials



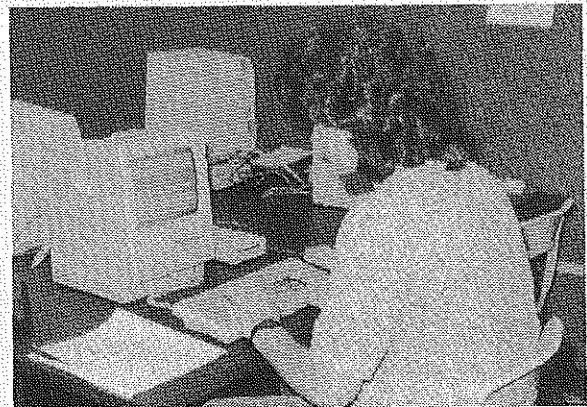
A combination of computer generated transparencies, the computer lab projection system, and individual student computer work stations enhance instruction on SOE recordkeeping. The set-up is also applicable for assisting students in completing the American Farmer Degree application.



Debora Barton, CI graduate student, uses Laser video disc technology to develop quality audio and visual instructional materials. The student has immediate access to these materials through the computer.



Spelling checkers help teachers and students produce quality printed materials.



Pamphlets that include text and graphics are easily produced for classroom use.

(Photos courtesy of Barbara J. Malpiedi, Assistant Professor, North Carolina State University.)