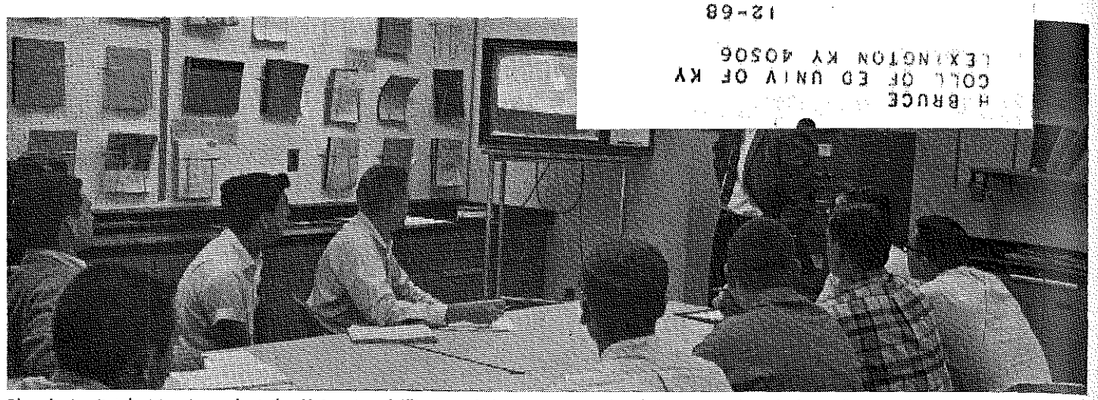


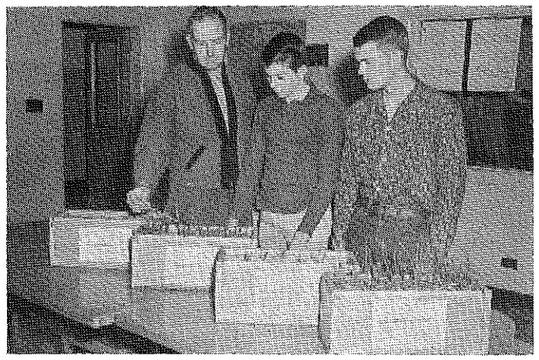
Closed circuit television is used at the University of Illinois to help prepare teachers of vocational agriculture. Students in agricultural education and their instructor, Paul Hemp, are observing a conference between a farm machinery dealer and a teacher of vocational agriculture.

Terrariums prepared by vocational floriculture students at Jackson High School, Michigan, as part of their laboratory experience. (Photo by Walter McCarley)

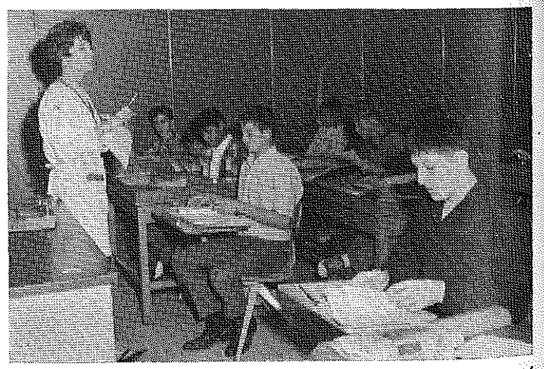
Stories in Pictures

GILBERT S. GUILER

Ohio State University



Fertilizer demonstration experiments prove to be an effective teaching technique in Kansas vocational agriculture departments. (Photo by Winegar)

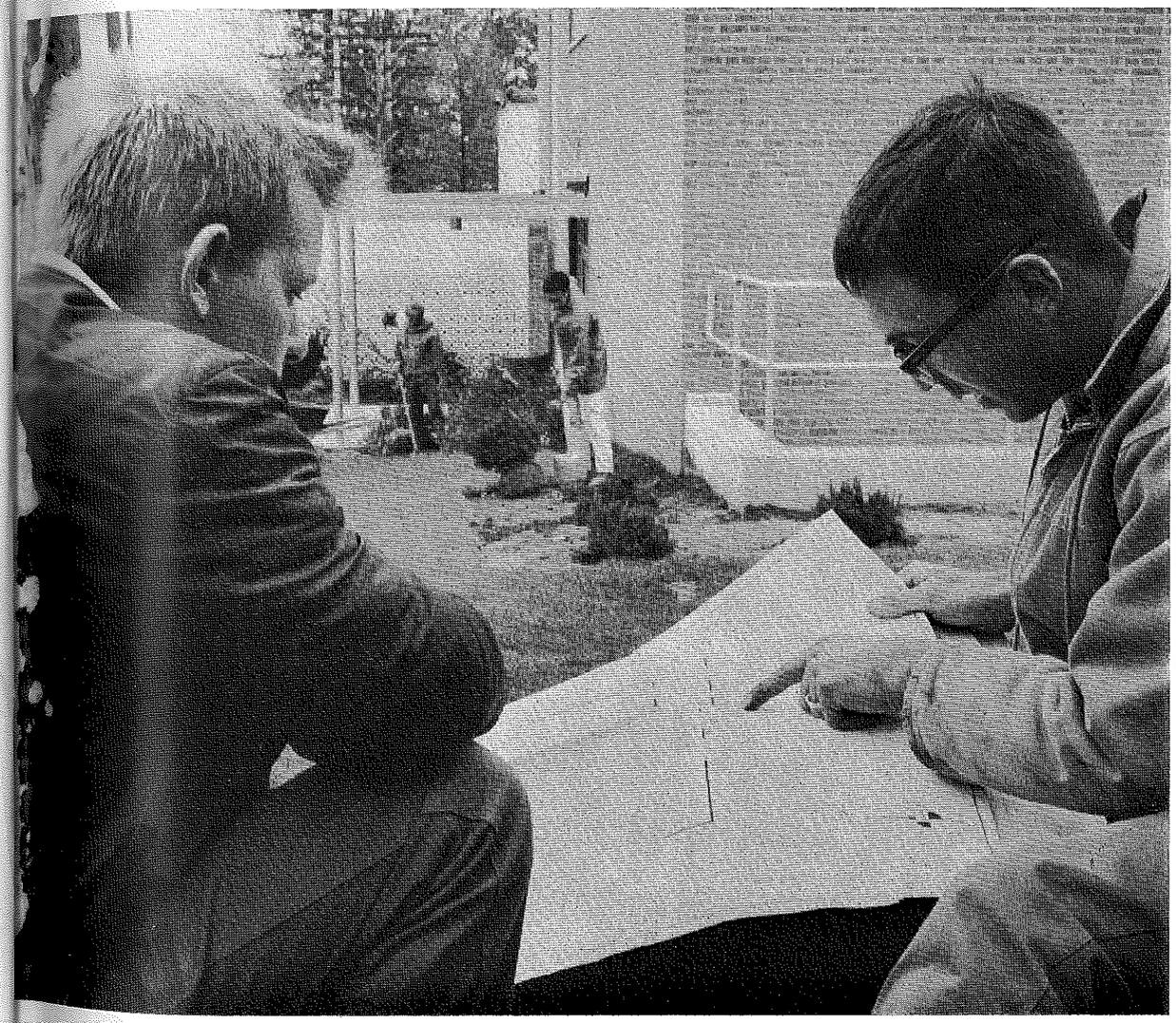


The first woman student teacher in agriculture from University of California at Davis instructs a class at Yuba City High School, California.

AGRICULTURAL EDUCATION

Agricultural Education

Volume 40 May, 1968 Number 11



Featuring —

INSTRUCTIONAL MATERIALS

THE
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Editorials

From the Editor . . .

Appropriate Uses of Methods and Materials


J. Robert Warmbrod

Emphasis on the development and production of instructional materials in agricultural education has never been greater. Current developments run the gamut from the traditional student reference materials to innovations such as programed instruction, single-concept film loops, and audio-tutorial systems. Many of the current efforts are built around the concept of individualizing instruction. Much of the work of selecting and designing instructional materials, previously accomplished by teachers if at all, is now accomplished by instructional materials specialists and others who are not directly involved in teaching in high schools and post-secondary institutions.

The provision for appropriate instructional materials as a necessary part of the teaching-learning process has always received high priority in agricultural education. It is not unusual then that increased emphasis on instructional materials development occupies a prominent role in current efforts to strengthen programs of agricultural education. Specifically, much of the current instructional materials development is prompted by the necessity that agricultural education be broadened to include instruction pertaining to all occupations—whether in business, industry, or on the farm and ranch—that involve knowledge and skills in agricultural subjects.

There are potential dangers accompanying the instructional materials movement that demand the attention of all agricultural educators. The first of these potential dangers is exemplified by the appeal for more emphasis on the teaching of basic principles. There can be no arguing with the contention that a desirable and necessary outcome of effective teaching is an understanding of basic scientific principles that are applicable to a wide range of occupations. Some of the newer instructional materials emphasize the content of instruction primarily in terms of basic principles with only scant attention to the manner in which students

(Continued on next page)

Guest Editorial . . .

Instructional Materials and the Teacher


E. M. Juergenson

Instructional materials is probably one of the oldest and most frequently discussed subjects in education. The use of instructional materials has probably influenced learning, for good or bad, as much as any facet of education. While instructional materials can make a teacher better, they are not substitutes for teaching or teachers. They can serve to spread the teacher's influence to more students or to wider areas.

What constitutes instructional materials? The best answer may be—anything utilized in teaching. The entire gamut of resource material used to assist a teacher in guiding the learning process could probably be classified as instructional materials.

Most of us are on the alert for new materials, and certainly this is important. Yet, lack of use of those already available or improper use may be the greatest problem. Correcting this situation might improve instruction and may yield far greater results than the search for new ones. How many of us use the blackboard, tape recorder, or overhead projector often enough and use them properly? How effectively do we design, construct, and utilize courses of study, units of instruction, and all the nuts and bolts items essential to effective instruction? Do we continually lecture when we should use mimeographed copies of material, demonstrations, resource persons, experiments, or a host of other kinds of instructional aids for more dynamic presentations?

With the advent of the Vocational Education Act of 1963 funds suddenly became available to develop a great many instructional materials, especially in agriculture, including such areas as landscape horticulture, forestry, rural recreation, and the service occupations. Some excellent materials were developed—for example, the modules of courses developed at the Center for Vocational and Technical Education at The Ohio State University. While there may be wider use of these materials than first glance indicates, in too many schools these materials are ordered and lie on shelves unused. It could well be that preparation of instructional materials must in some way involve the teacher

(Continued on next page)

Dr. E. M. Juergenson is Professor of Agricultural Education, University of California, Davis.

From the Editor . . .

learn or develop these principles. The point is that instructional materials that deal exclusively with basic principles are likely to lead to a subject-centered curriculum and deductive strategies of teaching. A subject-centered curriculum is in sharp contrast to student-centered instructional programs and inductive approaches to teaching that have been hallmarks of vocational education in agriculture.

When instructional materials emphasize the organization of content around basic principles, it is particularly important that the manner in which these principles are taught and learned is not ignored. The "new" in the "new math" and other curriculum innovations is not so much a change in the content of the curriculum as it is a new look at teaching and learning with special attention to the learner and the manner in which he is taught. Vocational agriculture has always paid as much or more attention to the student and the means by which he learns as to subject matter. Developers of instructional materials should insure that this philosophy continues to be reflected in instructional aids for agricultural education.

A second potential danger in current instructional materials development is that efforts toward individualizing instruction could fail to take into consideration the individual abilities, interests, and needs of students. Some of the newer instructional materials indicate that independent study is being confused with the concept of individualized instruction that makes provision for the individual differences of students. Study guides and other instructional aids that make it possible for a student to study alone do not insure that the needs, abilities, and interests of individuals are considered. An example is the study guide which directs the student to transfer material from a reference to a workbook with no direct interaction between student and teacher and no interaction among students. It can be argued that little learning takes place with this mode of instruction. In the first place, students must be taught how to work independently. Second, individual work of this type depends largely on the student's ability to read and comprehend written material—an adeptness which some students do not possess. And third, individual study affords little opportunity for active participation by the student in classroom or other group activity. Many students, especially those who do not read well, learn best when actively involved in classroom and laboratory activities.

The plea is simply this—that in the development and use of instructional materials we not confuse means with ends. The end sought is not to teach the content of an instructional materials packet. Our first concern is the student and an effective approach to teaching and learning. Then the appropriate instructional materials are developed to enhance the teaching-learning process. —JRW

Guest Editorial . . .

who has to use them in order for them to be effective.

Teachers of agriculture have long been surrounded by an array of instructional materials that is the envy of other teachers in the school. Consider the agricultural mechanics shop with its battery of fascinating machines and materials, or the agricultural science room with true-to-life, out-of-doors ownership experiences readily available to appeal to the natural instincts of students. Contrast this, for example, to the situation of the English teacher who has only books with which to work. Have we taken advantage of our materials? Do we improve ourselves in areas where we are unskilled so that students can appreciate and respect the technical competence of their teacher? If we give a public presentation using our materials does the slide projector work properly? Are slides right side up? Is our use of materials professional? In other words, do we overlook the obvious in established instructional materials or do we use them poorly?

New materials are always exciting and the temptation to go overboard in their use is ever present. Technical development has recently provided teachers with an untold wealth of sophisticated teaching aids. Television, single-concept films, dial access retrieval, language laboratories, learning centers, computerized instruction, teaching machines, and programed instruction are not on the horizon—they are here. There is a temptation either to be engulfed by them so that the means becomes the end, or to fear them so much that we leave them completely alone. Aside from the electronics involved, many of these aids are simply better ways of doing things teachers already know how to do and what good teachers are already doing. For example, when a student is given a set of animal breed identification cards and told to go through them checking the key until he knows the breeds, he is operating a simple teaching machine and touching on programed instruction. Most of these materials are expensive, but greater use and new technology will eventually put these items within the reach of all schools and instructors. Even now, the number being installed in secondary schools is high.

It is important to learn about these instructional aids as they become available and to grow with them. There are obvious advantages, for example, to the use of the single-concept film where an agricultural mechanics student who wants to learn to operate a cutting torch can independently observe a demonstration as often as he needs to; or an agricultural science student who was absent and missed the field trip on pruning can recapture the situation as often as needed. Such films, made by experts, not only free a teacher for other things, but frequently present material more adequately than the local instruction can. Television, compact and simple enough for instructional use, will soon be here. Imagine an instructor or student teacher capturing his class on film so that at the end of the day he can see it re-enacted in order to upgrade his or the students' performance. As modern teachers of agriculture, we must give students every advantage to learn.

There is as little danger of these new aids replacing the teacher as there was when printing was first invented. There is the possibility of improving instruction and spreading the influence of good teachers far beyond our present imagination.

Instructional Aids For Ornamental Horticulture

PAUL E. HEMP, Teacher Education
University of Illinois

Paul E. Hemp

This article reports the outcome of a project funded by the U.S. Office of Education which was directed by Dr. Paul E. Hemp. The report of the project is "University of Illinois Summer Institute for Teachers of Ornamental Horticulture in the Midwestern Section of the United States," Final Report, USOE Project No. 6-1538-1-32, November 1967, University of Illinois, Urbana. Dr. Hemp is Professor of Vocational and Technical Education, University of Illinois.

In recent years there has been a decided increase in the number and kind of curriculum materials prepared for student use. Self-teaching devices, programed learning kits, laboratory exercises, and student workbooks are gaining in popularity. The focus on instructional aids has shifted somewhat from the teacher to the student. But more specifically, the materials prepared for students involve more than reading about a particular area of agriculture. In using these materials students are often asked to respond to a question, perform an exercise, solve a problem, fill in a blank, or accomplish a job.

Instructional materials developed for teacher use are as necessary and important as they have been in the past. The teacher is still the "director of learning activities," and in playing this role he must have teaching guides, source units, and teaching plans to plan and supervise appropriate learning activities.

Types of Materials Prepared

As a part of a recent research project in ornamental horticulture, the writer worked with teachers and members of a research staff to develop and refine learning aids for students and teaching aids for teachers. The learning aids included fifty laboratory exercises for students to perform in turf management, horticulture mechanics, plant propagation, landscape maintenance, plant growth and development, and flowers and house plants. The laboratory exercises were prepared in such form that students could perform the exercises with a minimum of teacher supervision. Examples of exercises developed by the research staff were as follows:

- mixing potting soils
- fertilizing large trees
- identifying garden tools
- turf species and variety plots
- simple layering
- effects of growth and regulators on plants

Another learning aid developed for students by the research staff was an experience program planning guide and record book. This book was prepared to assist students in the development and execution of experience programs with special emphasis on activities which could be carried out at home or at school.

A series of seven source units were prepared by the research staff and a group of thirty teachers who attended a summer institute at the University of Illinois in 1966. These units, intended for teacher use, covered turf management, plant propagation, greenhouse management, arboriculture, nursery management, landscaping, and flowers. Each source unit included information on how to teach as well as typical questions which might be raised by students together with suggested answers.

THE COVER PICTURE

Students plant a landscape design from architect's drawings as supervised occupational experience in the nursery program in Michigan. Photo furnished by Michigan State University.

Procedures

The procedures followed in developing the curriculum materials were as follows:

- The research staff prepared the student laboratory exercises and experience program planning guide and record book after consulting with key teachers of horticulture concerning possible exercises to be developed and appropriate content to be included.
- The thirty teachers who attended the summer institute at the University of Illinois were asked to use and evaluate the laboratory exercises and the record book during the 1966-67 school year.
- The research staff used suggestions made by teachers to revise and refine the laboratory exercises and record book during the 1967-68 school year.
- The procedures used to prepare the seven source units were essentially the same as those used for the laboratory exercises and record book except that the initial drafts of the source units were prepared by the institute participants.

Feedback from Teachers

During the research project, evaluations of the curriculum materials were collected from teachers through personal visits to schools, completion of evaluation forms by teachers, and

(Continued on page 247)

Crop and Soil Science Laboratory . . .

A Valuable Instructional Aid

KEITH R. CARLSON
Vocational Agriculture Teacher
Belmond, Iowa


Keith R. Carlson

Have you ever wondered where to store some old charts or magazines? If so, you may have stored them in your crop and soil science laboratory. If you were to take an inventory of your laboratory area, what percentage of the contents are actually used to teach crop and soil science? Many of us would find that we could improve our facilities and at the same time improve our teaching.

Student Demonstrations

Crops and soils may not appeal to students like animal science or mechanics. But this may be only a reflection on our use of facilities. There are many ways to make learning about crops and soils stimulating to a high school student. None is more important than allowing a student to investigate for himself ideas that may arise from textbooks or instructor comments.

If a student reads that planter adjustment is important, he could be encouraged to explore the reasons for proper adjustment by setting up a demonstration of the emergence of seedlings from different depths below the surface of the soil. The student should be given time in class and provided with most of the materials for the demonstration. If the demonstration shows that depth of planting is important we have the student check the planter at home. In some cases it is also appropriate for him to repeat the demonstration at home. We must give each student an opportunity to challenge the material that he is asked to read. If we stimulate a student to question the depth that a seed should be planted and then do not provide him a way to explore the possible answers, we are missing one of the best tools of teaching.

Equipment Needed

From time to time I have varying degrees of success in my efforts to encourage students to challenge what they read. Unfortunately, many times lack of success is caused by the equipment and supplies with which the student was asked to work.

Just what equipment should we provide for students? If they are to learn about how crops grow, facilities should be provided for students to grow plants. This is especially true if much of our teaching is forced out of season by the school year. Specifically, the student should have easy access to the following:

- seed of the types grown in the area
- planting medium, peat or sand
- cups
- fertilizer of various grades
- cake pans of various sizes
- felt pins
- card board for signs

This is not a long or expensive list. You will find a need for additional items as students discover how plants grow.

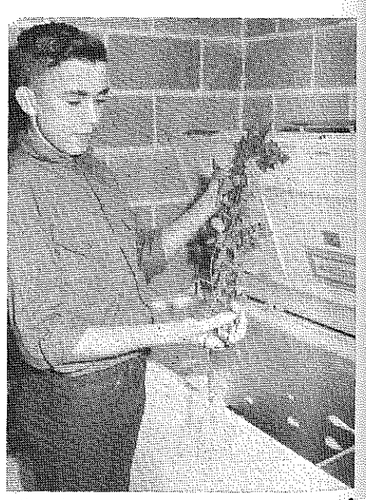
One of the more elaborate items of equipment I find very useful is a bank of gro-lux fluorescent lamps in a unit designed for home flower production. This unit provides light which will permit a more normal growth pattern. The cost of such a unit is comparable to many of the items in agricultural mechanics such as welders.

Another large item of equipment that we use in our crop and soil science laboratory is a used deep freeze. Plant samples collected during the summer are kept in good condition for student observation during the winter. Insect damage, disease symptoms, and growth patterns can easily be seen. The time needed to collect the samples is not great. These samples can be collected during instructional visits to high school students and adults during the summer.

Teacher Preparation

The teacher must take special effort to prepare himself for this type of teaching. There is no substitute for having the materials available. When a problem emerges that can easily be investigated, the class should immediately set up the demonstrations. They can not be expected to wait two days or two weeks while you find time to secure 2-4D to apply to a weed.

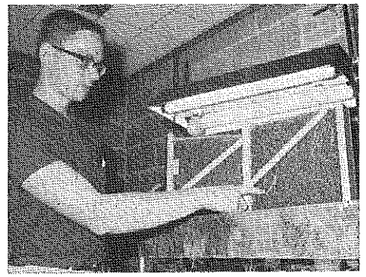
If possible the teacher should have several basic demonstrations for the class to use. These will give students much of the information needed to set up demonstrations. Once the students become accustomed to this type of learning they will not need as much assistance as may be needed in the beginning.

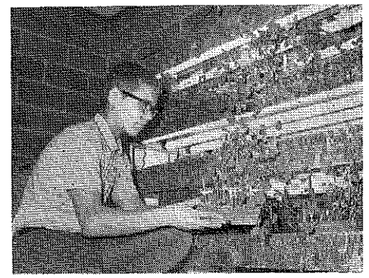

What do nodules look like on soybean roots? A tough question to answer in January—unless you have a deep freeze containing samples for student study.

The student must do more than set up the experiment. He should commit himself in writing about the expected results before they become obvious. Then as the results are available he can report to the class and turn in his written report of observations and applications. The form I use includes the following questions:

- What was the purpose of the demonstration?
- What procedure was used?
- What are your anticipated results from this demonstration?
- What were the results of this demonstration?
- What conclusions and farm applications can you make from this demonstration?

When this technique is used the emphasis is on solving problems, not memorizing facts. Crop and soil instruction becomes a science and as such deserves a laboratory. And the instructor is a teacher, not a teaching machine.




(Above)
Gro-lux fluorescent lamps provide a more normal growth pattern for plants. Here a student checks for results of cracked soybeans on germination as a part of a study of combine adjustment.

(Left)
How do roots grow when starter fertilizer is used? These simple boxes constructed with one side of glass allow a student to observe root behavior and growth.

Instructional Aids For Ornamental Horticulture *(Continued from page 245)*

formal discussions conducted at a follow-up meeting of institute participants. Some of the major suggestions made by teachers were as follows:

- Source units should include a section on problems and questions of students. Brief solutions or answers should be included to help the teacher prepare for his class.
- Suggested references and aids should be restricted to a selected group of books and aids which are readily available to teachers. Normally, teachers prefer to use circulars and bulletins prepared by their own land-grant college rather than order such materials from another state. Books and reference materials published by commercial concerns are usually written for a national audience.
- Teachers want source units prepared in such a way that a minimum amount of time will be spent on introducing and summarizing problem areas. The implications of this suggestion are that problem areas should not be too narrow in scope and that development of objectives and goals should be planned for broad instructional areas.
- Teachers like the idea of laboratory exercises for students but the exercises must be practical in terms of equipment and supplies used and in terms of level of difficulty. Laboratory exercises should include important skills that students need to learn in order to prepare themselves for employment.
- An experience program planning guide and record book is needed to help students plan and conduct supplementary experiences at home or at school. Record books designed for students who are on placement-employment options or students who are involved with farming programs are not very useful to students who are obtaining pre-employment or supplementary work experience at school or at home.

Other Observations

Additional observations and conclusions concerning the development and use of instructional aids made by the writer are as follows:

- Teachers are more likely to use teaching aids if they are involved in the development of these aids.
- A teaching aid is no substitute for knowledge and experience in the area to be taught. If a teacher has no experience or instruction in plant propagation, he probably cannot and will not use teaching aids on plant propagation with his classes. The pattern of inservice training used in Illinois, Pennsylvania, Oklahoma, and other states where summer institutes have been held is one of providing instruction in a technical agriculture area followed by the preparation of appropriate curriculum materials.
- If teachers are to reach more persons, teach a more diverse group of students, and teach new areas of subject matter then more and better instructional materials must be made available.

Summary

Curriculum materials in the field of ornamental horticulture were prepared by teachers and a research staff as a part of a project funded by the United States Office of Education. The materials were prepared especially for the midwestern section of the United States. Thirty teachers from six states field tested the materials and made suggestions regarding their value and use. The materials have been revised and will be made available to teachers throughout the United States by the summer of 1968.

Teacher Shortage Curtails Program Expansion

RALPH J. WOODIN, Teacher Education
The Ohio State University

A third annual assessment of supply and demand of teachers of vocational agriculture shows a more serious shortage in 1967 than in any previous year. Forty states last year curtailed programs because teachers were not available. These are some of the major findings of a study just completed at The Ohio State University.[1]

The Need for Information

The need for current information became evident in 1965 as the profession began planning a recruitment program as a means of meeting the shortage of teaching personnel. A committee was appointed at that time by the Agricultural Education Division of the American Vocational Association to plan a nationwide program of recruitment. Being unable to locate comprehensive and timely information on teacher supply and demand, the committee recommended that an annual survey be made. This year's study is basically a continuation of the studies of the two previous years but with the change that the information was collected in August, while in previous years the information was collected in October.

Head state supervisors and teacher educators in each of the states supplied the information used in the study. They were asked to report the number of teaching positions existing in their states, the numer of replacements needed, the number of new and additional positions which developed during the year, and to estimate the number of teachers which would be needed by 1970. In addition, information on the number of graduates that were qualified for teaching was secured from the department chairman of all colleges and universities preparing teachers of vocational agriculture. Replies were received from seventy-six institutions.

More Replacements Needed

The seriousness of the teacher shortage is indicated by the fact that departments of vocational agriculture in 117 high schools could not operate during the 1967-68 school year and that 242 teachers had to be employed with only temporary or emergency certificates. This study also shows that 232 teachers were needed but not available at the start of the 1967-68 school year.

Table 1 shows a slight decline in the total number of teaching positions during the past three years. The increase in number of replacements needed is largely due to the increasing rate of turnover of teachers. Another trend is that the number of teachers needed but not available has increased from 120 in 1965 to 232 in 1967.

The number of teaching positions which supervisors believed would become available in their states by 1970 decreased as the year 1970 approached. Supervisors revised their estimates downward by about 10 per cent since the question was first asked in 1965.

Ralph J. Woodin

Dr. Ralph J. Woodin serves as Chairman of The Professional Personnel Recruitment Committee of the Agricultural Education Division, American Vocational Association.

Placement of Agricultural Education Graduates

The percentage of agricultural education graduates entering various occupations during the past three years is shown in Table 2. Only about 60 per cent of those qualified entered teaching vocational agriculture in 1967. This is probably due to the wide choice of opportunities available in competing occupations. These competing occupations include graduate school, the armed forces, and others listed in Table 2. Had all of the graduates who were qualified in 1967 entered teaching, there would have been a surplus of teachers for the positions available.

More attractive salaries and better facilities may be a partial answer to the problem of competition from other occupations. One disconcerting trend is that the percentage of graduates entering the teaching profession during the past three years indicates a downward trend. On the other hand, the number entering graduate school and teaching other subjects has risen during this same period.

Table 1

A Three-Year Comparison of Teaching Positions in Vocational Agriculture in the United States

Item	1965	1966	1967
Total positions	10,378	10,325	10,221
Replacements required during the year	1,003	1,077	1,104
New positions added during year	— —	265	232
Teachers needed but not available	120	162	232
Teachers with temporary or emergency certificates	— —	252	242
Estimated number of teaching positions by 1970	12,888	11,257	11,246

[1]Ralph J. Woodin. "Supply and Demand of Teachers of Vocational Agriculture in the United States." Department of Agricultural Education, The Ohio State University, December, 1967.

The study shows . . . 232 teachers were needed but not available . . . 60 per cent of those qualified entered teaching . . . a shortage of teachers in 40 states.

Trends and Sources of Replacement

Some encouraging and some discouraging aspects of teacher supply and demand are shown in Table 3. It is encouraging to note that during the three year period the total number of qualified agricultural education graduates entering vocational agriculture teaching has increased from 671 to 742. This was not enough, however, to keep up with the demand. During this period, the number of teachers of vocational agriculture needed per year increased from 1,123 to 1,336.

Another encouraging feature is that the total number of qualified agricultural education graduates increased by nearly 200 during the three-year period. Unfortunately, the number of qualified persons entering teaching represented only 56 per cent of the need in 1967. It should be pointed out that the number of teachers of vocational agriculture needed, indicated in Table 3, includes "replacements required" plus "teachers needed but not available." This shortage was met in several ways which included closing some departments, by employing some temporarily certified individuals, and by employing some qualified teachers who re-entered teaching.

Table 2

Percentage of Agricultural Education Graduates Entering Various Occupations

Occupation	1965	1966	1967
		(per cent)	
Teaching vocational agriculture	64.6	61.4	60.2
Graduate work	9.2	10.0	12.4
Other work	4.7	8.2	7.2
Armed forces	6.7	7.0	5.5
Teaching other subjects	6.2	5.4	8.2
Farm sales, service, or supply	5.6	5.4	3.2
Farming	3.0	2.6	3.3

Table 3

Teaching Positions in Vocational Agriculture Filled by Qualified Graduates of Agricultural Education

Item	1965	1966	1967
Number of teachers of vocational agriculture needed[a]	1,123	1,239	1,336
Total number of qualified agricultural education graduates	1,038	1,151	1,233
Number of currently qualified agricultural education graduates entering vocational agriculture teaching	671	706	742
Percent of needed positions filled by currently qualified agricultural education graduates	60	57	56

[a]Includes replacements required plus teachers needed but not available.

Teaching Positions by State and Region

Considerable variation in numbers of teachers needed among the states shows up in the study. The five states with the highest number of new and returning teachers employed in 1967 were Texas with 125, Minnesota with 54, California with 50, Wisconsin with 44 and Illinois with 43. There was a shortage of teachers in 40 of the 50 states. Those states with the greatest shortages as of August 1, 1967, included Florida which needed 19; Texas, North Carolina, and Minnesota each needing 15, and New Jersey needing 14.

The states that were expanding vocational agriculture programs most rapidly and had the highest number of "new and additional positions" during the past year included Florida and Texas with 17, Minnesota with 16, and Virginia with 15.

Agricultural Education Graduates by Regions

The highest number of qualified graduates were prepared in the Southern Region, where 568 persons were qualified and 294 entered teaching. The highest number of qualified graduates were produced by Oklahoma State with 72, Ohio State with 58, Texas A & M with 44, and East Texas State University with 44.

Summary

This report suggests that the efforts in recruitment of teachers of vocational agriculture supported by all segments of the profession should be continued. The information obtained in this study should be used as a guide to recruitment activities. The evidence suggests that even though a concerted effort has been made over the past three years, carefully planned activities will need to be continued before the problem of the teacher shortage is met.

Improving Instruction with Super 8 Motion Pictures

ROBERT W. WALKER, Teacher Education
University of Illinois

Robert W. Walker

Have you tried to demonstrate to a group of students an intricate, manipulative operation such as sharpening a twist drill? How did you do? Did your students learn? If you feel that your demonstration was inadequate, join the throng of others who have had similar experiences attempting to teach a complicated, manipulative procedure. A solution is individual instruction, but implementing that solution is a problem that concerns many good teachers.

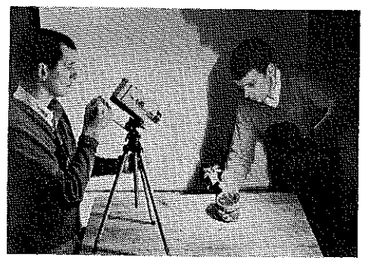
A major inadequacy of demonstrating to a group is the inability of the instructor to have all students near the subject or activity. As a matter of fact, students within three feet of the subject or activity may not detect the detailed manipulative performance of the instructor or the action of the object. What is the feasible answer? What instructional aid can the teacher use to assure that students really see what must be shown to understand fully the manipulative procedure or the reaction to the manipulation?

Super 8 mm. Motion Picture Camera

The new Super 8 camera mounted in a carefully selected position makes it possible for every student viewing the projected film to see exactly what the teacher had determined to be pertinent to the demonstration. Can the teacher who is not a camera bug use the camera and make quality motion pictures? Certainly, and with top results the first time. Actually, one does not stick his neck out very far to make such a statement because the Super 8 camera requires only two major operations: compose the picture and expose the film. First, the composition of the picture is extremely easy because the camera, a single reflex type, permits observation of the subject to be photographed to appear in the viewfinder of the camera exactly as it would appear when projected on the screen. Perhaps you are thinking, what about focus and camera lens setting? Do not be concerned. The answer to this question is built into the camera. Focus is accomplished by merely rotating the lens. The lens rim is calibrated in feet so that distance can be judged and set manually.

A photoelectric cell adjusts the aperture of the camera automatically to meter just the right amount of light to assure perfectly exposed pictures. The key to high-quality motion pictures is adequate light. Sunlight is perfect for illuminating subjects to be recorded on color film such as Kodachrome II, daylight type A. The closer the photographer comes to approximating bright daylight, the better his photographic accomplishments. Excellent pictures can be made with the assistance of the photo flood lamp or lamps.

What about loading the camera with film? There is nothing to this simple operation except opening a door and popping in a Super 8 cartridge. The Kodak people go so far as to say that the camera can be loaded after jumping from an airplane prior to opening the parachute.



Research assistants at the University of Illinois, Alvin LaMar and Thomas Nicholson, preparing to shoot a scene using the Kodak Super 8 motion picture camera.

Subjects to be Photographed

The motion picture camera does not replace the still camera, but it certainly has a capability that the still camera does not have. This capability is the ability of the camera to record subjects in motion. Teachers who use motion pictures to aid their instructional program will be concerned with operations that are sequential and manipulative. The camera can be used to record step-by-step operational procedures in demonstrations. Each student observes only that which the instructor predetermines to be relevant to the learning process.

Agricultural occupations instructors seeking better ways of teaching operational skills should consider using the motion picture camera. For example, the following tasks can be taught easily and effectively when a film loop is made to show the detailed performance of each operation.

- castrating pigs
- budding a peach tree
- sharpening a twist drill
- soldering copper tubing
- cutting, bending, and flaring copper tubing
- installing an electrical duplex receptacle

Figure 1
Format Sheet For Planning Film Loop

PLAN FOR FILM LOOP
(Length—three minutes)

Title (5-8 seconds)

Seconds	Scene Description (One minute—this page)	Materials, equipment, lighting, etc.
5		
10		
15		
20		

Film for the Super 8 Camera

Most outdoor and indoor pictures are taken with Kodachorme II, type A film. The film which is contained in a cartridge is fifty feet in length and when projected runs for approximately three minutes.

Length of Scenes

One of the first judgments is to decide the length of each scene. When developing instructional films, the "second" becomes the unit of time that is appropriate. As a rule of thumb, make short scenes last three seconds and long scenes ten seconds. Recently I made a motion picture to record thirty educational exhibits. Each exhibit was photographed for five seconds. The resulting fifty feet of film is a valuable instructional aid for teachers assisting students who are engaged in planning booth exhibits.

Figure 1 illustrates a format sheet that is very helpful in planning a 50-foot motion picture with a running time of three minutes. A page is used to plan for a running time of one minute. The individual preparing to shoot a film running three minutes will be concerned about the scene description, the length of the scene, and the props and equipment to be used in the scene. Careful planning will pay off. Remember, the camera records everything that happens—even errors.

Projection of the Film

Does the projection of Super 8 mm. film in the classroom compare favorably with 16 mm. film? The answer is "yes." For people not familiar with Super 8 a statement should be made to differentiate between standard 8 and Super 8. Because the sprocket holes are smaller on the Super 8 film, additional film area is exposed thereby increasing the picture area by 50 per cent which results in a projected picture comparable to 16 mm. pictures.

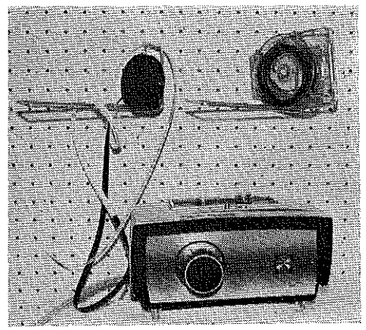
The film may be projected in two ways using the standard Super 8 projector or the closed loop projector. The film when returned from the processor may be projected immediately with the Super 8 standard projector. The projection time at the normal speed of the projector is about three minutes. However, the film may be projected in slow motion with a running time of approximately nine minutes or in fast motion with a running time of one minute.

The second way to project the film is accomplished with the use of the film loop or closed loop projector. After the film is processed the fifty feet of film plus an additional fifteen feet for titles and printed narration, if desired, may be placed in a special cartridge with the beginning and ending of the film fastened together to make a closed loop. When the cartridge is inserted into the film loop projector the machine is switched on, the film is projected and continues to project over and over until the machine is turned off.

What kind of a future does the closed loop Super 8 movie have? Certainly, a promising one. The closed loop projector and the closed loop movie have definite advantages over the short film projected with the standard Super 8 projector.

- The cartridges store very easily and are readily accessible.
- The educational short movie loop is enclosed in a dust, dirt, and finger proof container.
- The projection of the film starts immediately after the cartridge is inserted into the projector.
- Individual students may use the projector and film to review procedural techniques not fully understood at the first showing.

The Super 8 motion picture does have a bright future. Teachers are making use of an outstanding instructional aid capable of focusing on a manipulative, sequential performance and recording every action. One student or many students are able to observe that which the teacher considers to be relevant to the learning activity.



Top left: Fifty feet of Super 8 film after processing. Top right: The film loop cartridge containing fifty feet of film. Bottom: The Super 8 instant movie projector used to project film loops.

THE IMAGE OF VOCATIONAL AGRICULTURE

DAVID L. KIMBALL and EDWIN J. KERSTING
University of Connecticut

The image of vocational agriculture is intimately related to and in large part dependent upon the image of agriculture as a whole. And the image of both agriculture and vocational agriculture among the general public today is out-dated and inaccurate. The time-honored tiller of the soil has paled in contemporary comparison to the silver-suited astronaut.

ANTIQUATED IMAGE

No one would think of typifying modern industry as a water-powered grist mill down by the old mill stream. Yet the public seems not to have kept the same eye on the nation's biggest business—agriculture. A public with a somewhat antiquated image of agriculture is likely to have an unfavorable image of the vocational agriculture program. Too many citizens, parents, and school administrators view vocational agriculture as a "dumping ground" for the slow or troublesome student. Criticisms leveled at the program accuse it of being meaningless busywork in the manual arts, an unsophisticated bypass of more traditional courses, and needless training for an outmoded field.

These condemnations do point out weaknesses in the vocational agriculture program. But they also reflect the shroud of misinformation and lack of public knowledge of both agriculture and vocational education in agriculture in America. This naivete can be traced to several causes.

WHY?

The first is the ironic fact that simply because the American agriculturalist has become such an efficient producer, with relatively few farmers producing food and fiber for the rest of the nation, he has become more and more a minority group in a highly industrially-oriented nation. Today, a near microscopic minority of our population produces commodities for great masses of consumers here and abroad. The contemporary farmer feeds himself and thirty-nine others. In the past ten years alone, productivity has increased by one-fifth, despite the fact that one-third fewer farmers are harvesting one-ninth fewer acres. Farm subsidies are not in fact as large as some industrial subsidies, yet this aid to such a comparatively small group gives rise to the image of agriculture as a "coddled minority". Armed with prejudices about federal subsidies, the misinformed consumer views rising food prices as the last straw, ignorant of the fact that the farmer receives little more than three cents from a 22-cent loaf of bread.

Secondly, American culture increasingly has been led to respect the new and disdain the old—a basic product of modern merchandising and advertising. Agriculture, being one of man's oldest occupations, thus comes in for a large share of Twentieth Century disdain. This is the status of agriculture among a significant sector of the general public.

Lastly, the Sputnik-inspired educational philosophy of the mid-fifties helped further gear the nation's thinking toward technological advance. Science—physics, electronics, chemistry and space medicine—was touted as the only field for enterprising scholars. America had entered the Space Age, and the average American — understandably preoccupied with the machinations of space technology—gave little thought and still less notice to simultaneous advances in the field of agriculture.

PUBLIC NEEDS TO HEAR

There is no need to list the remarkable technological and scientific advances in agriculture within the last fifty years in a professional journal such as this one. All of us in the field are aware of them; it is our business to keep abreast of such developments. It is the general public that needs to be told agriculture's story. Atomic reactors, supersonic jets, and manned space flights are achievements that dazzle us all because they have never before existed. Man has eaten meats and vegetables for centuries and it does not amaze him that they are still on his table. Furthermore he accepts these commodities with little knowledge that the methods of their production have changed markedly in recent generations.

There are few potential headlines in the fact that potatoes, corn, beef, and cotton fiber are available again this year. The consumer takes for granted their presence in the marketplace and buys them, largely ignorant of the fact that these products are of higher quality, produced with more advanced techniques, and with much greater efficiency than ever before in the history of mankind.

David L. Kimball

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Edwin J. Kersting

"Vocational agriculture has the facilities and background to enhance greatly its own image, as well as the image of all agriculture, through programs tailored for the general public."

LACKLUSTER IMAGE

All of these factors have contributed to the lackluster image of vocational education in agriculture. In addition, parents and guidance counselors often have steered interested and qualified students away from vocational agriculture programs on the assumption that agriculture was at best an unrewarding, dead-end occupation.

Vocational agriculture has been seen as a program designed to categorically return rural youngsters to the farm from whence they came. This was, of course, the basic intention of the Smith-Hughes Act of 1917, enacted during a bygone era of American culture, when lower per-acre farm yields, a growing population with increased food and fiber needs and a more rural nation prevailed.

But for several years now, it has been apparent to agricultural educators that vocational agriculture could no longer confine itself to the education of present and prospective farmers, as was suggested in 1917. The Vocational Education Act of 1963 officially opened a route which many vocational agriculture teachers had been unofficially travelling for a number of years: the training of students for *non-farm* occupations—the agriculturally related industries such as engineering, horticulture, plant science, meat processing, and agricultural service and supply businesses.

However, a large segment of the public does not envision American agriculture as a complex industry. Cognizant only of the decline in the number of farms in the country, and unaware of the blossoming opportunities in the agriculturally related industries, vocational agriculture's critics have asserted that vocational programs waste the student's time—that those students with college potential should spend their time in other courses. This may or may not be true. It depends on the student and the guidance the student receives. Realistically a student with academic ability may easily combine college preparatory work with agriculture courses, thereby strengthening his interest in agriculture and broadening his base for a college education. Conversely, a student with lesser academic ability, whose vocational activities detract from the time which should be committed to a greater understanding of subjects as math, English and sciences may experience considerable difficulty gaining admission to a college or university.

Another claim of some critics is that students enroll in vocational agriculture programs because the courses are considered easy to pass, and they can avoid other more difficult courses. This appears to be rationalization, for it is almost axiomatic that the challenge or lack of it in any course depends as much on the instructor as it does on the subject matter.

UPDATING THE IMAGE

Objections to vocational agriculture seem often to stem not from flaws in the program itself—but from a lack of knowledge of the role played by modern agriculture, the dynamic growth of this traditional field, and its tremendous potential for the future. The American public needs to hear about the new agriculture.

While modern vocational agriculture programs are already doing a creditable job in updating the image of agriculture by offering theory and practice in new agriculture to the citizens and parents of tomorrow, they are still falling short of realizing an important potential achievement of vocational agriculture: updating the image of vocational agriculture and agriculture among the general public.

The formal vocational agriculture curriculum reaches primarily those with some interest and experience in agriculture to begin with. Those who have the most need of seeing and hearing about the new face of agriculture are those who know the least about it. They are the ones who, through their lack of knowledge and misinformation, perpetuate the inaccurate and unfavorable stereotype and sometimes pass on legislation affecting agriculture and its programs.

Vocational agriculture has the facilities and background to greatly enhance its own image, as well as that of all agriculture, through programs, displays, lectures, and demonstrations tailored for the general public. Of course, open houses and exhibits of some sort are already integral in high school vocational agriculture programs. But these efforts, if expanded, can reap much greater dividends.

Public activities that draw only those already committed to agriculture and not those who might beneficially be interested in agriculture fall short of real success. They are in effect agriculture talking to itself—agriculture talking to those already members of the same "family." As the number of people attracted to vocational agriculture sponsored public programs and told the eye-opening story of modern agriculture increases, the faster and more beneficially the image of agriculture will change. How many vocational agriculture centers become the rallying point for the area garden club?

ENERGETIC LEADERSHIP

Other branches of agriculture can and should participate in this public enlightenment program. Some of them are already doing so. But vocational agriculture with its unique nationwide structure can take the leadership in this endeavor. It stands to gain heavily, not only in the increased esteem bred of greater understanding among the public, but in the higher caliber of potential agriculturalists it will attract as the image of modern, dynamic agriculture replaces the prevalent stereotype.

The challenges and opportunities in agriculture have never been greater. Nor has there ever been a greater need for enthusiastic, energetic, and innovative leadership in changing the image of agriculture.

IMPLEMENTING CONCEPTS OF LEARNING IN TEACHING AGRICULTURE

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Samuel M. Curtis

Learning theory and educational practice are sometimes strangers in the classroom. To better relate some aspects of theory and practice, six theoretical concepts are selected for their application in teaching vocational agriculture.

CONCEPTS OF LEARNING

Teacher behavior influences classroom learning. "The teacher's classroom personality and behavior influenced the behavior of the children she taught."[1] Teachers must be cognizant of this precept and attempt by their behaviors to create a classroom climate conducive for learning. Some guideposts for the teacher in creating a learning atmosphere are:

- Take an interest in the individual student. This involves a knowledge of his goals, capabilities, and opportunities.
- Entertain the ideas and contributions of the learner in the classroom, in the shop, and in supervised practice.
- Help the student define and verbalize his problems in a non-threatening atmosphere.
- Value each individual's contributions to the learning situation and commend constructive effort.

The organization or sequencing of lesson material affects learning. Many resource units in agricultural subject matter have been developed for teacher use by teacher education departments, state departments of education, and commercial organizations. Love provides criteria for the construction of these units when he calls for "a planned sequence of teaching-learning activities which is psychologically sound to the learner. . . ."[2] Shontz[3] and Drawbaugh[4] demonstrated that resource units, prepared with Love's concept in mind, increased student learning. Teachers can and should adapt and use the many good resource units available. In subject areas where units have not been written, the teacher must develop his own material. Units and lessons should be structured in terms of the learners' needs. Student needs vary from time to time and from group to group. The good teacher is aware of the differences and reconciles them in terms of the learners involved. The use of the unit approach apparently combines problem areas into "organic wholes."

The structure of a group affects the progress of learning as well as the kind of learning that takes place. Trow says, "We can safely accept the view that group phenomena definitely affects the progress of learning, as well as the kind of learning that takes place."[5] Lewin believes that it is sometimes easier to change group behavior than individual behavior.[6] The teacher can analyze the class group to determine group cohesiveness, group interaction, group standards, and group goals. An attempt should be made to use these group factors to accomplish specific educational objectives. Some illustrations follow:

- Replace, when it exists, fear of failure with an appreciation of cooperative effort. Employ group discussions to evaluate programs and determine goals.
- Recognize that some forms of classroom behavior are mechanisms developed to relieve tension.
- Utilize the social pressure of the class group to minimize deviant behavior that obstructs learning.
- Improve group climate through group diagnosis of success and failure.
- Group consideration of individual problems will solidify the importance of the group for the individual members.

Goal determination can be a source of increased motivation. Justman states, ". . . unless goals are recognized, improvement is haphazard and unlikely to be effective."[7] Goal orientation gives cohesiveness to the group and purpose to the individual. It is important to note that if the learner has the responsibility for identifying and developing goals, motivation is increased. The teacher can help each learner determine his goals and help the class formulate class goals in spe-

(Continued on page 257)

This article was authorized for publication (November, 1967) as paper No. 3327 in the journal series of the Pennsylvania Agricultural Experiment Station.

[1]Nathaniel L. Gage (Editor), *Handbook of Research on Teaching* (Chicago: Rand, McNally and Company, 1963), p. 693.
[2]Gene M. Love, "Outlines for Preparing A Course of Study in Vocational Agriculture and A Teacher's Unit Plan." Teacher Education Series Volume IV (Department of Agricultural Education, The Pennsylvania State University, 1963), p. 2.
[3]David F. Shontz, "An Experiment in Teaching Agricultural Occupations Information to High School Students" (D.Ed. dissertation, The Pennsylvania State University, 1963), p. 66.
[4]Charles C. Drawbaugh, "A Teaching Experiment in the Use of Greenhouse Facilities in Vocational Agriculture" (D.Ed. dissertation, The Pennsylvania State University, 1963), p. 92.
[5]W. C. Trow, "Psychology of Group Behavior," *Journal of Educational Psychology*, (October, 1950).
[6]Kurt Lewin, "Group Decisions and Social Change," *Readings in Psychology*, (1960), pp. 197-211.
[7]Joseph Justman and Walter H. Mais, *College Teaching* (New York: Harper and Row, 1957), p. 257.


Ray Roundtree

Making Teaching More Meaningful

RAY ROUNDTREE
Teacher of Agriculture
Bush High School, London, Kentucky

One of the most challenging problems encountered by teachers of agriculture is motivation of students. I have found that impelling students to have a desire to learn is one of my greatest challenges.

During the summer of 1967, I took a course at the University of Kentucky on selecting teaching materials. Until I had taken this course I did not realize the large number and kind of instructional materials there are available for teaching agriculture. I believe that one of the best means to motivate students is the proper use of teaching aids.

A Variety of Aids

There are many aids which teachers of agriculture can use. Have you tried the overhead projector? Have you used the bulletin board to best advantage when teaching a unit? Have you used slides or filmstrips? Have you recently used a "real life" object. If you have not used a variety of aids, I feel you are missing a wonderful opportunity to increase learning.

One of the best teaching aids is the overhead projector. I can present to the students materials which cannot be effectively presented on the chalkboard. It is easy to see the change in interest of students when you begin to use this teaching aid.

When I use charts and graphs the easel becomes very helpful. Charts and graphs permit the teacher to have material ready to be presented rather than taking class time to prepare it or put it on the chalkboard.

It is very interesting to note how properly prepared bulletin boards, planned in connection with teaching units, have aided my teaching. The bulletin board greatly enhances the learning process and helps add meaning to materials being presented.

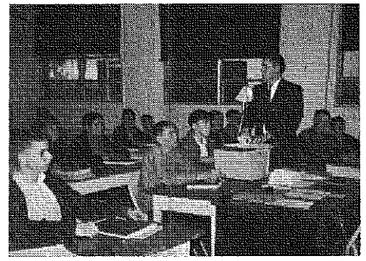
Meaningful Teaching

I have also found that a meaningful way to motivate students is the use of pictures. The pictures may be on slides or filmstrips, or they may simply be pictures taken from a publication. I feel it has rightfully been said that "a picture is worth a thousand words."

Learning takes on new meaning when a "real life" object is there for pupils to see. Even though it may seem insignificant, the use of an ear of corn or a bolus gun can be every effective in classroom teaching.

The cost of many of these aids is very low. I have found that they can be very helpful in developing more meaning for pupils. The value received is far more than the cost.

It is true that students learn when the subject being taught is made meaningful. How meaningful are you making your classes for your pupils? I must admit that I was falling short. By using more and better teaching materials, I feel I have improved my teaching. The learning process seems to have become more vivid to my students. Give these ideas a try if you aren't already using them.


The overhead projector is one of the best teaching aids. The overhead projector can be used to present materials that cannot be presented effectively on the chalkboard.

Themes for Future Issues

June	***Evaluation***
July	***Agricultural Education in Programs Involving Other Vocational Services***
August	***Adult Education***
September	***Agricultural Education for Persons with Special Needs***
October	***Agricultural Education in City Schools***
November	***Supervision in Agricultural Education***
December	***Supervised Occupational Experience in Agricultural Education***

The Function Approach for Identifying Curriculum Content: Part I

RAYMOND M. CLARK and O. DONALD MEADERS
Teacher Education
Michigan State University

O. Donald Meaders

The authors describe in a two-part article the background, description, rationale, and research pertaining to the function approach to curriculum development. The concluding part of the article will appear in the June issue.

Raymond M. Clark

The decade of the sixties has been one of transition of vocational agricultural education from training for farming to training for farming *and* for employment in agricultural business and industry. To say that the transition is complete would obviously be a mistake. It will take much experience and study, as well as a long time, to complete the transition.

As educators attempt to develop suitable training programs for non-farm agricultural business, it becomes clearly apparent that the content of instruction comes from two or more of the traditional vocational fields. It is no longer possible, if it ever was, to provide an adequate package of subject matter entirely from one field of vocational education.

THE BACKGROUND

Kennedy's[1] early study of curriculum development for non-farm agricultural programs sought to clarify the relationship between farming and certain agricultural occupations other than farming. This study clarified the position of workers in agricultural occupations and developed techniques that served as a useful guide in determining the agricultural content of instructional programs for training workers for non-farm agricultural occupations. His research helped establish definitional distinctions between agricultural businesses-industries and agricultural occupations.

The following implications drawn by Kennedy provided the background for subsequent research that contributed to the function approach for identifying curriculum content.

In developing curricula for training persons for agricultural occupations, recognition should be given to the specialized nature of many of these occupations and to the differences in the amount of knowledge of farming needed, as well as to the area in which this knowledge is needed. These differences imply that training programs should be flexible in length, breadth, and depth, and adjusted to the requirements of the occupation or job.

Occupational classification systems should give more consideration to the kind of work done and to the knowledges, skills, abilities, and interests required of the worker than to the industry or field in which the occupation exists.

Occupational descriptions, in addition to reporting the physical activity of the worker, should reflect to a greater degree than at present the knowledge used and the managerial operations performed by the worker.

Job analysis has been used to develop a framework for identifying curriculum content for educational programs that prepare persons for work in industry. Realizing the shortcomings of this approach, educators are seeking a more logical and workable framework from which to proceed. The *function,* as such a framework, was suggested and considerable effort has been expended in developing a plan for the use of the function approach for identifying curriculum content.

The purpose of this two-part article is to describe a process for developing training programs for agricultural business and industry. Reports of research conducted at Michigan State University will be described. This review will include projects leading to the development of the function approach for curriculum development and reports of staff projects and doctoral dissertations dealing with various aspects of the function approach.

THE FUNCTION APPROACH

Definition

Functions of a business or industry have been defined as the operation that must be performed somewhere in the business or industry in order for it to be successful. Function denotes a relatively precise process performed to achieve an outcome which is essential to the overall purpose of the industry. The approach is geared to the identification of the functions—such as processing, transporting, purchasing, selling, and accounting—which are performed at various levels within the industry. The activities necessary for accomplishing the functions are determined which, in turn, are used as a basis for identifying the competencies needed by the individuals who are expected to perform the activities.

Philosophy

Underlying the function approach to planning vocational-technical education programs is a vocational philosophy. Its focus is on preparation for the world of work based on the identification of (a) the specific requirements for performance in terms of activities contributing to a particular function in a relationship to the unity of the overall industry and (b) the general requirements for living related to the specific relationships of the industry to society. That is, we are concerned with mobility — geographic, horizontal and vertical — of individuals with vocational satisfactions, with specific non-work related contributions to society, and with education to prepare for further study.

The nature and scope of the activities to be performed by people in an industry makes it apparent that a well-rounded program must include instruction in such areas as science, mathematics, communication, and other academic subjects. But there must be enough integration of these subjects with occupational objectives to enable the student to see the application of these subjects to his occupational goals.

We must recognize our long standing tradition in education of attempting to teach disciplines in the same context that the scientist has dissected them for research and analysis. The student has been responsible for unifying bits and pieces of information into some kind of a whole as it is related to the performance of a job in an industry. It is imperative that vocational educators accept the responsibility of unifying the bits and pieces of information into a whole which is related generally to life and specifically to a particular arena of work. Vocational education cannot afford the luxury of offering programs based on bits and pieces of information unique to a traditional discipline because the occupational world is not structured on this basis.

Unifying Disciplines

The function approach then becomes one method of unifying the unique information from one or more traditional disciplines into a whole. These educational programs become a means of helping individuals achieve vocational development and acquire competencies necessary for entering the world of work. Educational programs that rely on the structural content of a traditional discipline for content become increasingly out of step with the world of work. Programs structured on content of a single discipline make it difficult if not impossible to bring about a unifying effect. Furthermore, vocational education must increasingly make sure that its clientele is provided with more than mere preparation to fit existing jobs. Clientele must be adaptable to technological change and contribute to a changing technology.

The unifying effect of the functions approach offers hope in combining content from physical and the social sciences in a manner which is more palatable to students and more meaningfully related to the world of work. Such a unifying effect offers educators a method of developing a structural framework which may prove helpful in their quest to exert an influence on the development of society and the technology which serves that society.

A Process

The functions approach is an attempt to view vocational education as a process. Vocational education is viewed as a process concerned with both people and the requirements of employers; a process that does not begin with a course nor end with a course; a process that does not begin nor end with any particular age; a process concerned with developing a whole. The process is concerned with unifying several elements to effect an orderly educational program. The elements of the process include:

- knowledge of the developmental process of humans
- knowledge of the learning process of humans
- knowledge of the human performance requirements of technology
- knowledge of the content disciplines.

The limitations to effective implementation of the process are:

- our ability to "tie together" the elements of the process into meaningful educational programs, and
- our willingness to mobilize our resources to attempt the task.

REVIEWS OF RESEARCH

Research conducted at Michigan State University that has contributed to and further refined the function approach for determining curriculum content will constitute the concluding part of this two-part article. Part II of the article will appear in the next issue.

Implementing Concepts of Learning

(Continued from page 254)

cific terms. Also implied is periodic assessment with learners on their progress toward individual and group goals.

Feedback processes can facilitate learning in the classroom. To quote Lewin, "realistic fact-finding and evaluation is a prerequisite for any learning."[8] To some extent feedback is always present. What is needed is greater teacher awareness of feedback which is promoted in an atmosphere conducive to constructive evaluation of the feedback received. The teacher who encourages feedback will improve motivation and increase learning. In order to do this, he must:

- Be aware of the subtle reactions in the classroom that reflect classroom climate.
- Use evaluation as a teaching device rather than as a measuring instrument only.
- Structure tests to reflect the purposes of instruction. The use of problem solving tests, performance of skills, and simulation models are examples of this procedure.
- Subject goals to reassessment and change goals as conditions warrant.
- Assist students in the diagnosis of their past performance and the translation of this evaluation to future activities.

The class needs to know how they are going to be graded. Grades are important to the vocational agriculture student in high school or technical school although probably to a lesser degree than to the academic student. "Most students are motivated to get passing grades, and thus grades are a powerful motivational tool for teachers. Because grades are important to them, students will learn whatever is necessary to get the grades they want."[9] Therefore, it is important that in the process of obtaining a grade the learner secure the kind of learning the teacher wants to take place. Consequently, the teacher is careful to:

- Base all grades upon the overall goals of the course and the specific goals of the class. Bugelski emphasizes

(Continued on page 260)

[1]Kennedy, William Henry. "A Clarification of Relationships Between Farming and Certain Other Agricultural Occupations with Implications for Guidance and Curricular Development." Unpublished Ed.D. dissertation, Michigan State University, 1958.

[8]Lewin, *loc. cit.*
[9]Gage, *op. cit.,* p. 1119

INSTRUCTIONAL MATERIALS ON AGRICULTURAL CREDIT

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With the advent of science and technology on the agricultural scene, it has become imperative that farmers specialize and increase their scope of production. This increase in production might take several routes, one of which could be an increase in the size of farms. It is generally agreed that as the size of farms increases the need for credit also increases. Farm management and financial assistance are mutually interrelated to such an extent that the successful producer can no longer ignore the value of credit. Being cognizant of this fact, vocational agriculture teachers are including more agricultural credit instruction in the program of instruction. Therefore, it becomes important that adequate instructional materials be developed in the area of credit.

The Study

This article reports the results of a study that involved the development and evaluation of instructional materials pertaining to agricultural credit. A resource unit, "A Handbook of Agricultural Credit for Vocational Agriculture in Tennessee," and an instructional supplement were developed for use in teaching agricultural credit. The instructional supplement included suggested teacher and student activities, definitions of terms, problems on computing costs, credit surveys, and visual aids materials.

The instructional materials were evaluated through an experimental study involving the vocational agriculture teachers and students in twenty-five high schools in Tennessee. Each participating school was randomly selected with five schools assigned to each of the following groups:

Group	Type of Instructional Material
I	Control; no instructional materials
II	Handbook only
III	Handbook and teaching assistance[1]
IV	Handbook and instructional supplement
V	Handbook, instructional supplement, and teaching assistance[1]

Each participating teacher taught a unit on agricultural credit for a total of two weeks after which a test was given to the students receiving the instruction. Approximately one month later a second test was given to determine the extent of the students' retention of knowledge of agricultural credit. A questionnaire concerning the handbook and supplement was completed by each participating teacher to assist in evaluating the instructional materials.

[1]Teaching assistance refers to visits to schools at the beginning of the study to clarify what was expected in the teaching of the unit.

The Results

It was found that a combination of the handbook and the instructional supplement was superior to the other teaching methods. Teaching assistance, as used with Group V, did not result in scores by students that were significantly greater than the scores of students in Group IV. Using analysis of variance techniques and the multiple range test, the ranking of the means for the five groups indicated that Group IV ranked highest with Groups V, III, II, and I occupying the next four ranks. Tests of significant differences revealed some overlapping among all groups except Group I which differed significantly from all other groups.

An analysis of test scores indicating students' knowledge of agricultural credit revealed no significant differences between the mean scores on the test administered immediately after the period of instruction and the mean scores on the test administered one month after the completion of instruction on agricultural credit.

Teacher Evaluation of Instructional Materials

Teachers reported that readability of the "Handbook" was clear. They rated the "Handbook" as very comprehensive with enough detail in the presentation of information. The teachers recommended that the "Handbook" be used with junior and senior high school students. The study showed that the "Handbook" could be used by both teachers and students in studying agricultural credit. Forty per cent of the teachers indicated a need for in-service education in agricultural credit to enhance their presentation of instruction on agricultural credit. The strongest recommendation of the teachers was that more visual aid materials be provided.

Sixty per cent of the teachers indicated that the transparencies of the instructional supplement were helpful in presenting the concepts of credit. All teachers indicated that problems on computation of credit costs were beneficial. Suggested class activities were given good and excellent ratings.

The time factor in the study presented problems in terms of the teachers being able to cover effectively all sections of the "Handbook" in a two-week period. A period of six weeks would be more appropriate to cover all aspects of agricultural credit.

Conclusions

The results of the study indicate that the "Handbook" and instructional supplement are appropriate, suitable, and effective educational materials for use with junior and senior high school students in vocational agriculture.

More use of credit in agricultural

(Continued on page 260)

This article is based on the author's M.S. thesis, "An Evaluation of A Handbook of Agricultural Credit for Vocational Agriculture in Tennessee," completed at the University of Tennessee, June 1967.

Raymond A. Holt

The Need for Instructional Materials

ROBERT KENNEDY
Hartnell College
Salinas, California

In planning for teaching a specific subject, the ideal would be for the teacher to be a specialist in that particular field. This would mean that the teacher have a thorough knowledge of the best texts, references, research, and audio-visuals plus a background of actual experience in the specific area of study.

Master Teachers

As high school teachers, most of us have at least one subject specialty but beyond this we are more generalist than specialist. It then becomes necessary that we become "masters of learning experiences"—the art and science for which we are granted credentials as a teacher.

But wouldn't it be much better to be both specialist and master teacher? I propose two ideas that are intended to help teachers be a little more of each. The first suggestion is that teachers need to know what audio-visual and other instructional aids are available. The second suggestion is that teachers must have instructional materials better organized if they are going to be used effectively.

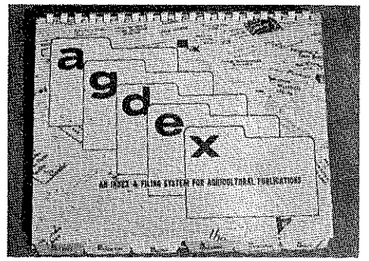
Instructional Materials Available

In my search for audio-visuals for use in vocational agriculture, I was surprised to find many materials available. But on the other hand, it was discouraging that such an organized search was necessary to locate the instructional materials that are available.

I have just recently catalogued over 700 audio-visuals for agricultural science.[1] The catalog includes films, filmstrips, transparencies, models, and other instructional aids that will make teaching more efficient and effective. The entries in the catalog are indexed by subject area and the source from which each item can be obtained is indicated.

When this article was written, Robert Kennedy was Director of Agriculture, Wasonville High School, Watsonville, California.

[1]*Audio Visuals for Agricultural Science.* Sacramento, Calif.: Bureau of Agricultural Education, State Department of Education, 1967.



AGDEX, an index and filing system for agricultural publications, was developed at The Ohio State University. The system is published and distributed by The Iowa State University Press, Ames, Iowa.

A System of Indexing

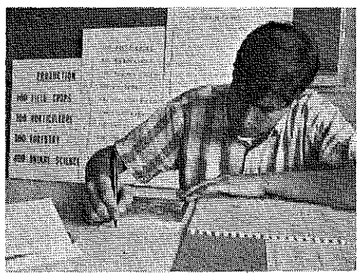
In addition to knowing about and having instructional materials available, teachers must also have instructional materials properly indexed and filed. I recommend the AGDEX system of classifying, indexing, and filing. Simplicity is the system's major selling point. Almost one thousand subject headings are grouped under ten commonly used, easily memorized subject areas. Many agricultural colleges, extension services, and national organizations now place AGDEX file numbers on materials at the time of publication.

The AGDEX system is not just for materials in a filing cabinet. The system can be extended to library books, filmstrips, lesson handouts, and other types of teaching aids. I suggest that someone be asked to explain the system at your next meeting of agricultural teachers. The key that unlocks the AGDEX system is the codebook that may be obtained from the Iowa State University Press, Ames, Iowa.

Let Students Reorganize Files

Maybe our students can profit as much from a reorganization of instructional materials files as teachers. If your filing system is not what you would like it to be, have your students reorganize and index the files using the AGDEX system. Just think of what your students can learn in reorganizing your files. Remember, you must teach them how to go about the job.

- Students become acquainted with the reference materials in the department.
- A broad overview of agriculture is presented including the scope and importance of agri-business.
- Students see the importance of the sciences that support agriculture.
- Students learn about government and private organizations that are involved in agriculture.
- Students become acquainted with fields of agriculture that they did not know existed.



Students learn a great deal in setting up and using the AGDEX system.

BOOK REVIEWS

TEACHING TRICKS by E. M. Juergenson and Ernest A. Tarone. Danville, Ill.: Interstate Printers and Publishers, 1967. 171 pp. $3.95.

This is a new edition of an earlier book that has been rewritten because of the demand for the earlier edition. The authors have revised the book to make it more applicable to the newer approaches to vocational education.

Teaching Tricks is not a methods book. The authors assume that the reader is schooled in the techniques of teaching. The purpose of this book is to suggest some "props" or "aids" to the teacher which will help to stimulate both teacher and students and make the learning situation more dynamic.

Chapters of the book indicate many areas where the tricks contribute to effective teaching. Chapter titles are: Teaching Tricks for the New Teacher, Teaching Tricks for Using Visual Aids, Teaching Tricks for Supervised Practice, Teaching Tricks for Student and Young Organizations, Teaching Tricks for Maintaining Good Relations, and Teaching Tricks for Maintaining Discipline.

E. M. Juergenson is Teacher Educator, University of California, Davis, and Ernest Tarone is Chairman of the Agriculture Department, Modesto Junior College, Modesto, California.

Raymond M. Clark,
Michigan State University

ORGANIZING AND CONDUCTING YOUNG FARMER PROGRAMS IN NEW YORK STATE by Harold R. Cushman. Ithaca, N.Y.: New York State College of Agriculture, Cornell Miscellaneous Bulletin 83, 1967. 36 pp. 30 cents.

The author states that one of the purposes of this bulletin is to make the experiences of outstanding agriculture teachers available to persons in out-of-school educational programs. The information is here. It seems the next problem is that of distribution.

The text begins by defining young farmer programs and explaining their importance and benefits. This is followed by suggestions for making satisfactory administrative arrangements for conducting the program. Procedures for determining needs, analysis of problems, and planning and conducting instruction follow in logical sequence. The values of a young farmer association are discussed. A section on evaluation completes the bulletin.

The approach is that of farm business management toward the goals of the young farmers involved. A number of examples and forms are included. The reader may not find revolutionary new ideas in this bulletin. Yet the information presented is in a concise, logical sequence that should be of value to every vocational agriculture teacher, be he a beginner or a veteran of many years in the profession, in or out of New York.

Neil O. Snepp
Michigan State University

Implementing Concepts of Learning in Teaching Agriculture

(Continued from page 257)

that these goals and the criteria for success in the course be written out and available to the students.[10]

- Outline the evaluation procedures to the class indicating how classroom, shop, and supervised practice will affect grades.

- Discuss grading procedures for supervised practice in detail. Indicate that the quality of record book and production efficiency factors are important criteria for evaluating productive enterprises. For supervised work experience, indicate that employer's rating has considerable importance. Knowledge of grades should be relayed to the students as quickly as possible. Binkley's admonition is appropriate, "he (the learner) should see evaluation as a means of determining where he is now with reference to his desired goals. It is possible to evaluate learning in such a way that the students will look upon evaluation as interesting and helpful to them."[11] Admittedly this is a difficult assignment among grade conscious students in a public school system where historically grades have been used as a threat.

SUMMARY

"The teacher is the primary ingredient in the learning process."[12] Thus, the teacher has the responsibility to be aware of the conditions conducive to learning. This responsibility includes: an awareness of group structure and processes, knowledge that teacher behavior affects the desire of the student to learn, cognizance of the fact that the identification of group and individual goals is an essential step in the learning process, and realization of the teacher's leadership roles in group awareness, feedback, structuring of subject matter, and goal definition.

[10]B. R. Bugelski, *The Psychology of Learning Applied to Teaching*, (New York: Bobbs-Merrill Company, 1964), p. 259.
[11]Harold R. Binkley, "A Basis for Effective Teaching" (Department of Agricultural Education, University of Kentucky), p. 173.
[12]Gage, *op. cit.*, p. 685.

Agricultural Credit

(Continued from page 258)

operations has created a demand for agricultural credit instruction. Instruction in agricultural credit should be expanded in the future. An educational program in agricultural credit should be conducted not only in high school classes but also in adult education programs. An educational program of this type should include instruction on credit needs, sources of credit, costs of credit, credit instruments and documents, loan procedures, repayment plans, and case studies with emphasis placed on credit costs and credit instruments.

Continuous efforts should be made to up-date current instructional materials and to provide new instructional materials on agricultural credit. It is recommended that a handbook of student exercises in agricultural credit be developed. Inservice courses and short courses in agricultural credit should be provided for teachers of agriculture. These inservice courses should include instruction in the areas of agricultural credit recommended for high school instruction.

Professional Organizations

American Association of Teacher Educators in Agriculture

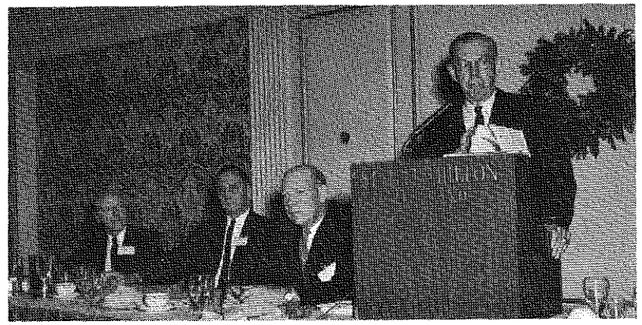
AATEA Officers for 1968: (Left to right) George Luster, University of Kentucky, Treasurer; Charles C. Drawbaugh Rutgers, Secretary; Irving Cross, Colorado State University, Vice President Pacific Region; Earl H. Knebel, Texas A&M University, President; Alfred H. Krebs, University of Maryland, Past President; Orville E. Thompson, University of California, President-Elect; W. T. Loften, University of Florida, Vice President Southern Region; Richard H. Wilson, The Ohio State University, Vice President Central Region; (not pictured) Ralph P. Barwick, Vice President Atlantic Region.

The National Vocational Agricultural Teachers' Association

NVATA Officers for 1968: (Front row, left to right) Sam Stenzel, Treasurer; Tom Devin, President; Elvin Walker, Past President; James Wall, Executive Secretary. (Standing, left to right) Alfred Wm. Hansen, Vice President Region I; W. T. Black, Vice President Region II; Millard Gundlach, Vice President Region III; Glen McDowell, Vice President Region IV; Travis Hendren, Vice President Region V; William Smith, Vice President Region VI.

National Association of Supervisors of Agricultural Education

NASAE Officers for 1968: (Left to right) Dale C. Aebischer, Wisconsin, President; T. L. Faulkner, Alabama; L. C. Dalton, New Mexico, Past President; Neville Hunsicker, Chief, Agricultural Education, U. S. Office of Education; (Officers not pictured) Julian M. Carter, Vermont, Secretary-Treasurer; L. L. Turner, Connecticut, Vice President Atlantic Region; W. C. Montgomery, Kentucky, Vice President Central Region; Kenneth K. Mitchell, Tennessee, Vice President Southern Region; Bert L. Brown, Washington, Vice President Pacific Region.



A Contribution of Vocational Agriculture —

The Project Method of Instruction

JOHN F. THOMPSON, Teacher Education
University of Wisconsin

WHAT WOULD HAPPEN IF: Vocational education in agriculture were to lose sight of its primary contribution to American education.

We must first of all formulate the question of what is the primary contribution of agricultural education to the American education scene? There are a variety of education activities and practices that have been introduced to American education through the instructional programs offered in vocational agriculture, and it is possible to promote many of these as the primary contribution that vocational agricultural education has made to American education. But in my opinion, the primary contribution of vocational agriculture to the American educational scene is the *project method of instruction.*

I observe also in current literature, in texts, in the vocational programs of many schools, in the attitudes of some vocational agriculture teachers and many high level officials who do not have a vocational education background, that this concept—the project method of instruction—is being ignored or has already been dropped. We are even at the point, in some places, of referring to the total vocational agricultural program of a high school as "academic agriculture."

The project method of instruction was formulated in vocational agriculture for a variety of very sound educational reasons. Among these were to motivate students, to provide for transfer of learning, to assure an opportunity for the student to practice techniques and skills, to provide for involvement, to facilitate supervision, to permit a student to achieve independence, to contribute to family economic and social progress, to increase the self-concept of the student and to make education relevant to the student's everyday life. It seems to me that the project method of instruction is as educationally sound today as it has ever been. It is imperative that as programs are initiated to implement the broader occupational objectives in vocational agriculture, that we do not lose sight of the project method of instruction and its educational advantages. True, in our expanded programs, the concept needs to be operationalized far differently than we operationalize it through a beef steer, through an acre of corn, or through a total farming program on a boy's home farm. For example: Through class projects in an agri-business program.

Now let's answer the question raised by the title. If our expanded programs are permitted to lose the project method of instruction, they will simply be like most, if not all, programs of general education. The project method of instruction is a critical and necessary component of the methodology of vocational education. Thus, as we lose the project method of instruction, we lose much of our effectiveness.

INSTRUCTIONAL MATERIALS AVAILABLE

Course of Study in Nonfarm Agricultural Occupations Area: Agricultural Supply Businesses—Sales and Service Occupations

Copies are available from: Harold R. Binkley, Division of Vocational Education, College of Education, University of Kentucky, Lexington, Kentucky 40506.

A Description and Source Listing of Professional Information in Agricultural Education, 1967-68

This compilation of instructional materials is developed and published annually by the Professional Information Committee of the Agricultural Education Division of the American Vocational Association. Copies (10 cents each) are available from: Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Illinois 61801.


Grant Fettig

A Summer Project for the FFA

GRANT FETTIG, Teacher of Agriculture
Grant, Michigan
and
LEDWARD E. SMITH, Teacher of Agriculture
Maxwell, Indiana


Ledward E. Smith

Are you looking for a summer FFA project? Could your students use some new experiences?

An Exchange Program

In August 1966 the Grant, Michigan, and Maxwell, Indiana, FFA chapters initiated an exchange program designed to provide new experiences to both students and their teachers. In 1966 nine members of Grant High School FFA traveled to Maxwell, Indiana, to initiate a FFA exchange program between the two schools.

Prior to the exchange, arrangements were made through correspondence that included the names, ages, and agricultural interests of the boys who were to be involved in the exchange. Boys from the Grant FFA lived with boys of similiar age and agricultural interests. Boys from the Hancock Central FFA chapter at Maxwell, Indiana, were on hand to meet their counterparts from Michigan. Only introductions and shifting of luggage were necessary and the boys were on their way.

The Michigan FFA member participated in all activities of his host family in Indiana during the three days of the exchange program. Each visiting boy worked and lived on the farm of his host.

All was not work, however. Many of the boys found an opportunity to go swimming or take a trip to a county fair. One evening the Hancock Central FFA treated the Michigan boys to a watermelon feed. This gave the visiting members a chance to get acquainted with the members and work of the Hancock Central FFA.

During August 1967, members of the Hancock Central FFA returned the visit to Grant, Michigan. The procedure of placing the boys on Michigan farms was the same as that followed the summer before. When possible, the boy who hosted a Michigan boy in 1966 was the guest of that boy on the return trip.

A Michigan canoe trip offered a different recreational experience for the Indiana FFA members. It also gave the visitors a chance to meet more of the Michigan boys.

Benefit to Students

We find that the exchange program was educational in many ways. Each group of students had the opportunity to experience first-hand the agriculture in another state. The experience of living with another family for three days was an educational experience for all boys.


A canoe trip on the Muskegon River near Grant, Michigan, offered a different recreational experience for the FFA members from Hancock Central High School, Maxwell, Indiana.

The exchange trip was recreational. Even though the boys were required to work on the farms of their hosts, all enjoyed the exchange. The planned recreational activities were very successful.

An exchange trip such as this can be used as an inexpensive reward for members in your chapter. In our exchange trip the only cost involved was gas, watermelon, and canoe rental.

Benefits to Teachers

Probably one of the highlights of the exchange trip from a teacher's point of view was the inservice education which the trip provided. The opportunity to live with another vocational agriculture teacher for three days and participate in the activities in which he was engaged was invaluable. The exchange trip provided the opportunity to discuss FFA programs of work, instructional aids, curriculum, and many other things that are of concern to teachers.

Getting Started

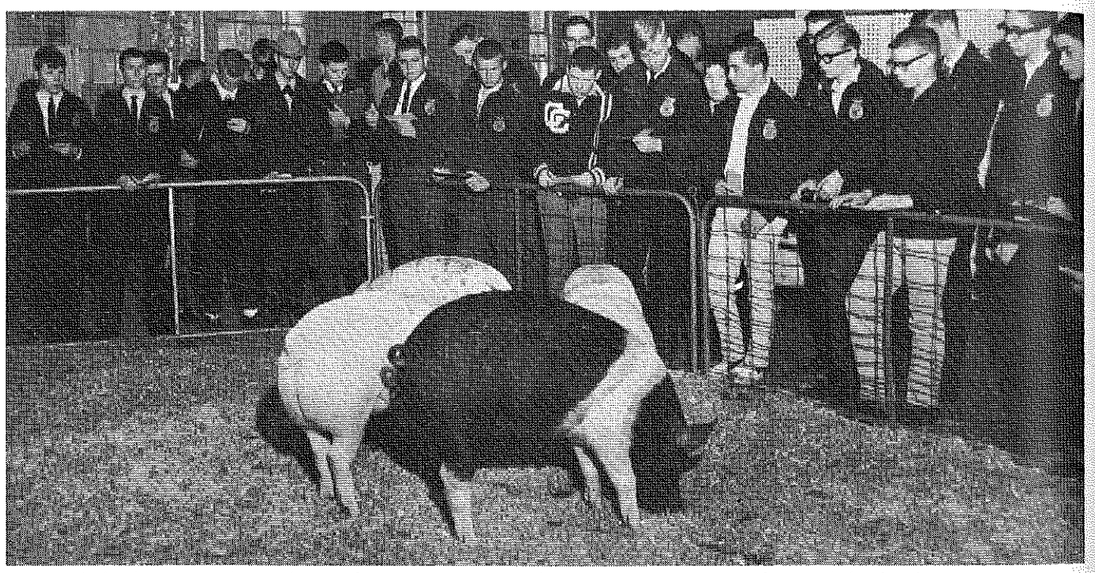
How can you get an exchange trip started? Actually it's quite simple. First, select a state that you would like to visit. Next, contact a state officer of the state vocational agriculture teachers association and ask that he relay your desire for an exchange trip to the teachers in his state. Send your name and address so that interested teachers can contact you. Once you are contacted by a group interested in an exchange program, you are on your way to a worthwhile experience.

Stories in Pictures

GILBERT S. GUILER

Ohio State University

Michigan students operate semi-automatic bagger for pot plants. (Photo by Walter McCarley)



Nebraska vocational agriculture students use a ring of market swine as their instructional materials for this class situation.

Future Minnesota vocational agriculture teachers, enrolled in Methods of Teaching Agricultural Mechanics, learn concrete block construction principles by the "doing process." (Photo by F. Bear)

AGRICULTURAL EDUCATION

Agricultural Education

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Featuring —

EVALUATION