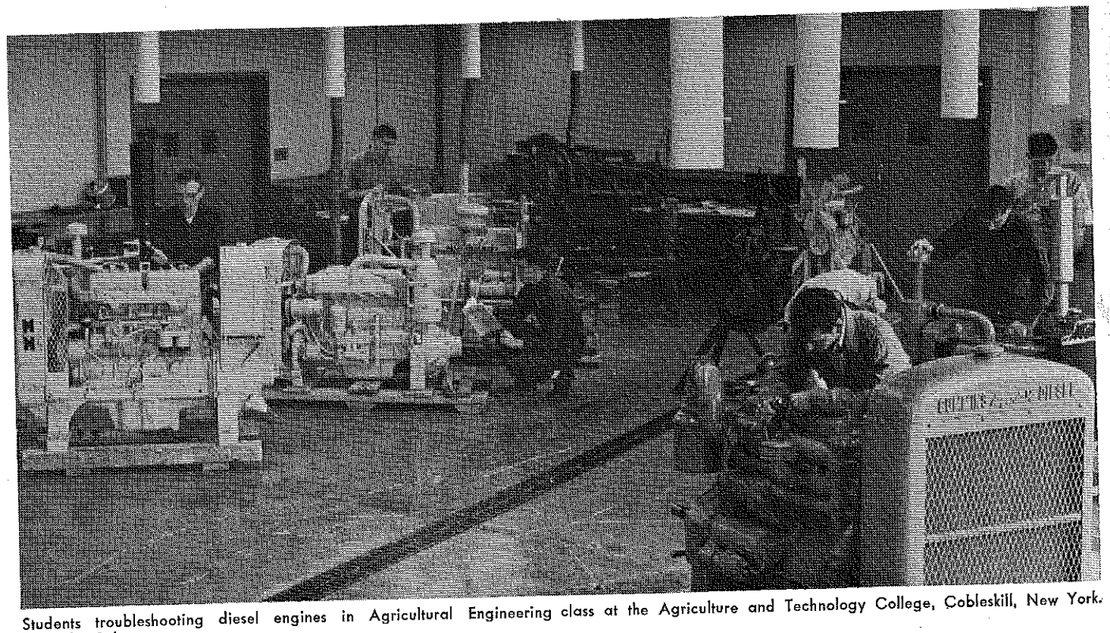
Team of New Hampshire students in a survey course taken by all Forestry Technology and Soil, Water and Construction Technology majors. Photo by Annis.

Stories in Pictures

GILBERT S. GUILER

Ohio State University



Students troubleshooting diesel engines in Agricultural Engineering class at the Agriculture and Technology College, Cobleskill, New York. Photo by Sidney

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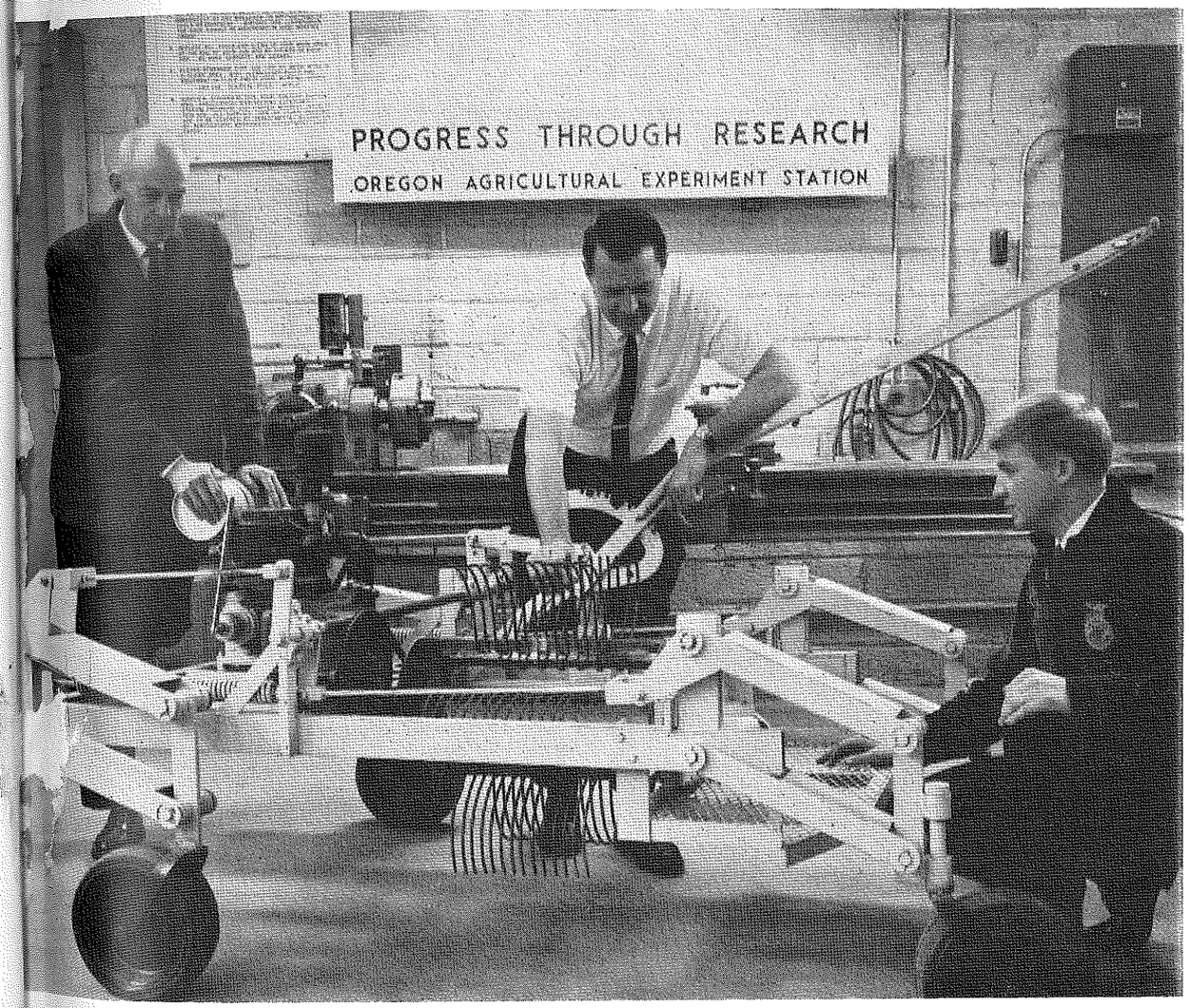

Featuring—

RESEARCH AND DEVELOPMENT

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EDPRESS

Editorials

From the Editor . . .

The Teacher's Role in Research

J. Robert Warmbrod

The teacher plays an important and unique role in determining the effectiveness of research in the development and improvement of educational programs in agriculture. Teachers with their direct contacts with students, the school, and the community are the primary agents through which scientific findings are implemented and adopted. Teachers are "where the action is," hence their attitudes, knowledge, and skill pertaining to research in agricultural education are of utmost importance. What is the role of the teacher in a program of research in agricultural education?

Usually the role of the teacher, or practitioner in education, is characterized as a consumer of research. This description of the teacher's role implies that the primary task of the teacher is to implement the findings of the researcher. So in a schema of research moving from basic research through developmental research and field testing to the dissemination of findings, the teacher's efforts are limited primarily to the dissemination phase. A description of the practitioner's function solely as a consumer of research results in a rather uninteresting and unexciting role for the teacher. Such a position leaves limited opportunities for creative thought and action on the part of the teacher. In a sense, such a posture is authoritarian in that the teacher is handed the researcher's findings with the request or charge that the findings be put into operation. Perhaps this is the reason that many practitioners in agricultural education, as suggested by one writer in this issue, pay little attention to research as a vital force contributing to program innovation. There is no arguing with the fact that the teacher is a primary agent through which research findings are implemented. The point, however, is that for teachers to become enthused about research in agricultural education, they must assume additional tasks for which they are uniquely qualified.

The teacher is in an enviable position, at least from the point of view of the researcher, for identifying areas of investigation where research is needed. A perceptive and

(Continued on next page)

Guest Editorial . . .

Our Attitude Toward Research

GEORGE L. O'KELLEY, JR., Teacher Education
University of Georgia

The attitude of agricultural educators toward research techniques and research findings as tools for program planning has for all practical purposes run the full gamut during recent years. From one extreme of caring little and actually doing less about research the majority of us today at least profess great allegiance for any and all research oriented effort. There is evidence that an increasing number of agricultural educators are engaged at varying levels of involvement in research projects.

The fact that the country as a whole during this period has also undergone a change in attitude toward research should not be overlooked. Agricultural educators would be curious specimen indeed if they had, in effect, stood aside while a research-oriented society passed them by. Apparently as a nation, we are committed to further expansion and refinement of research efforts. More and more of government, business, and institutional resources are being devoted to research.

It has not been too many years since more than 90 per cent of all agricultural education related research was conducted by graduate students in fulfilling degree program requirements. The passage of the 1963 Vocational Education Act and the Elementary and Secondary Education Act of 1965 coupled with the nation's growing dependence on new research findings has changed all that. Today research is a byword—practically every state has one or more agricultural education staff members devoting part or full time to the production of research findings. Many states have several. Those in leadership positions are begging for research based facts upon which to project programs. Those who would ridicule or even depreciate research are in a minority—almost ignored.

This change of attitude is all to the good! Let us look to an increasing demand that all program changes be supported by strong and unassailable research findings.

(Continued on next page)

From the Editor . . .

curious teacher can come up with the tough questions to which research should be addressed. The identification of problems for research is not only an important but also a difficult task. To perform this task well, the teacher must have a thorough knowledge of the purposes and possibilities of public school education in agriculture. The teacher performing the task of problem identification looks to the future and views the findings of research not as final answers but as a source of additional ideas worthy of investigation. It is imperative that the teacher as identifier of research problems be concerned with significant and controversial issues rather than piddling and petty concerns. Researchers in agricultural education should actively seek the advice and counsel of teachers relative to instructional problems with high priority for research.

Probably the most important role that teachers can assume in research—and the role which results in the greatest contribution to program development and improvement—is that of conducting research. The teacher who wishes to contribute to the development and improvement of educational programs must be involved in both formal and informal research. Here the teacher has the pleasure, and assumes the risk, of putting ideas to the test. Teachers have advantages for conducting research that the researcher does not have. Teachers are in a position to give the idea or procedure a trial in the type of situation in which it was intended. Teachers get immediate feedback of ideas tested, a privilege rarely afforded the researcher.

Teachers with proper direction and guidance are capable of conducting creditable research. Any review or compilation of research in agricultural education reveals that most of the research reported is conducted by graduate students, almost all of whom are former teachers of agriculture. The research specialist in agricultural education should solicit the teacher as a member of the research team.

If research is to contribute significantly to the development and improvement of programs in agricultural education, it is not enough for the practitioner only to be acquainted with what research says. Actually we are all practitioners in agricultural education—whether teachers in high schools and post-high school institutions, administrators and supervisors in state departments of education, or teacher educators in colleges and universities.

So each of us, while acquiring a knowledge of research in agricultural education, must be diligent in identifying problems for investigation and become active participants in the research process.—JRW

Guest Editorial . . .

But in the process, let us be certain that the research we produce is of such calibre and sophistication, that not only do we feel secure in acting upon it, but our professional colleagues will have respect for it also.

Agricultural education now and in the foreseeable future needs more research conscious and research competent staff members—either as producers or consumers of research findings.

Leaders in every state should be making immediate effort to identify and assign capable persons to protected situations for the production of quality research. They will need financial support, professional assistance, encouragement and guidance as they seek truth. The truth they seek will not come quickly but when it is found, it will withstand the test of trial by application.

We live in a research conscious society. The future of agriculture education is dependent upon the intelligent utilization of research techniques and findings. Right now we are a long way from being able to meet the competition. But we are moving forward. How fast we move will be in almost direct proportion to the respect agricultural educators show for the upcoming research explosion.

NEW PUBLICATIONS FROM THE ERIC CLEARINGHOUSE ON VOCATIONAL AND TECHNICAL EDUCATION

In September 1967, the ERIC Clearinghouse on Vocational and Technical Education issued the first of a continuing series of publications. The two publications, known as *Abstracts of Research and Related Materials in Vocational and Technical Education* (ARM) and as *Abstracts of Instructinonal Materials in Vocational and Technical Education* (AIM) are issued quarterly (Fall, Winter, Spring, Summer). ARM includes abstracts of research and other materials which are useful to a wide audience of users interested in vocational and technical education. AIM includes abstracts of materials typically designed for teacher use or student use in the classroom, and annotations of bibliographies or lists of instructional materials. AIM will be of particular interest to teachers, curriculum specialists, supervisors and administrators involved in the use of instructional materials in the teaching-learning setting, or in curriculum development. Subscriptions are available at $9.00 per year for ARM and $9.00 per year for AIM. Individual issues are $2.75. Order forms should be requested from Publications Clerk, The Center for Vocational and Technical Education, 980 Kinnear Road, Columbus, Ohio 43212.

THE COVER PICTURE

An experimental model of a mechanical strawberry picker developed by Oregon State University agricultural engineer Dean E. Booster (center) is observed by agricultural mechanic specialist Leon V. Christensen (left) and Oregon State University agricultural education student Mike Shelby. Photograph supplied by Monty Maltamen, State Supervisor of Agricultural Education, State Department of Education, Salem, Oregon.

Implementing Research in Agricultural Education

JULIAN M. CAMPBELL, Supervision
Virginia Department of Education

Julian M. Campbell

This article is from a speech presented by Mr. Campbell to the Agricultural Education Division during the convention of the American Vocational Association, Cleveland, Ohio, December 7, 1967.

It is encouraging and significant that in recent years greater effort and increasing emphasis are being directed toward sound research projects in agricultural education. We must, however, concentrate on the implementation of the findings of our research projects and establish priorities if our efforts are to be most effective.

Writing in the September, 1966, issue of the *American Vocational Journal,* Professor H. M. Hamlin writes, "Much of what has been done (research in vocational education) has been narrow, insignificant and amateurish." Whether you agree or disagree with this statement, it merits careful study and consideration in establishing priorities and planning research projects in agricultural education. It does appear, however, that in recent years many of the research studies have made significant contributions to the profession and have provided guidelines for improving and determining appropriate instructional programs particularly in areas such as the development of instructional materials, and the development of effective pilot or developmental programs.

Future Research

The Vocational Education Act of 1963 provides vocational education with a new stimulus—a new spring board for action. It provides for more flexibility and for broader objectives. At the same time it brings additional problems such as: What should be taught? How should it be taught? The Act also makes special provisions for supporting sound research programs.

Perhaps more long-range research should be planned by staff members, and if necessary, completed in parts by graduate students or by others as additional researchers are employed.

Great changes are taking place in American agriculture and in schools and communities. There is no evidence that the rate of change in agriculture or education will decrease. If we are to move forward, continuous programs of effective research are needed to help improve and refine programs and to give direction in the years ahead. Administrative studies have certainly attracted attention because of efforts to define and outline new programs.

Research is needed to determine teaching procedures effective in changing attitudes, motivating students, and developing an understanding of how new knowledge relates to knowledge and skills already learned. Some feel that this is a great weakness in education. Almost everyone knows more than he can use.

When thinking of future studies student selection, placement, and follow-up should certainly be of interest and concern. Evaluation is especially important in light of the "end product" being turned out in agricultural education at all levels.

We need to encourage closer coordination of agricultural education research with the Agricultural Experiment Stations utilizing all available facilities and avoiding unnecessary duplication.

Suggestions for Implementing Research

★ Efforts need to be continued toward promoting, evaluating, and disseminating occupational information. Some procedure should be established to facilitate the summarization of significant research so it can be disseminated to teachers. This might involve having the researcher or a committee identify the implications of the research for educational practice. The outgrowth of this could lead to pilot programs to determine the "real" or practical value of the research findings. The establishment of clearinghouses of ERIC and Regional Research Centers should be invaluable in coordinating and conducting research projects and for the dissemination of the results of occupational research, pilot, demonstration, or experimental programs.

★ A State staff committee from each state should have several hours each year at a joint staff conference to consider how research findings might apply to program improvement within the state and to consider the innovative approaches or pilot programs suggested through research findings.

★ Research findings need to be interpreted in "teacher language" for publication in journals and other publications read by teachers. Findings have little or no value unless used. They will not be used when reported in jargon that is not easily understood by the reader. A popular style of writing would help in this respect.

★ Use teacher research committees to report the findings of significant research and to suggest areas in which additional research is needed. In Virginia we have six area research committees with the chairman of each making up the membership of the State Committee.

(Continued on page 214)

Cleo A. Dupy

Cooperative Occupational Experience Programs in Agriculture

CLEO A. DUPY, Assistant Director
Southern Oklahoma Area Vocational-Technical Center
and
WILLIAM L. HULL, Teacher Education
Oklahoma State University

William L. Hull

Program development for off-farm agricultural occupations grew out of 1963 vocational education legislation. Program objectives were revised,[1] and supervised practices updated to include occupational experiences in agricultural businesses.

Monies from section 4 (c) of P.L. 88-210 supported a teacher education institute at Oklahoma State University designed to teach distributive skills to vocational agriculture teachers. Participants in this institute were encouraged to initiate and/or develop a cooperative occupational experience program in agriculture. This article reports the results of a master's thesis which investigated implementation problems of thirty teachers who attended the first session of the institute.[2]

Data were collected by personal interview with twenty-eight vocational agriculture teachers in ten states from three to five months after they attended the previously mentioned six-weeks institute on off-farm agricultural distribution. Most of the items on the interview schedule were constructed responses. However, volunteer comments from the teachers left impressions of their feelings towards the program. At least one full day was spent in the local community with each respondent and other persons associated with the agricultural distribution program. The data were treated with appropriate nonparametric statistics.

This study assumed that placement of students under the supervision of the agriculture teacher for pay in agricultural businesses constituted implementation of an agricultural distribution program. No attempt was made to assess the quality of the experiences either in the business or in the classroom.

Findings of the Study

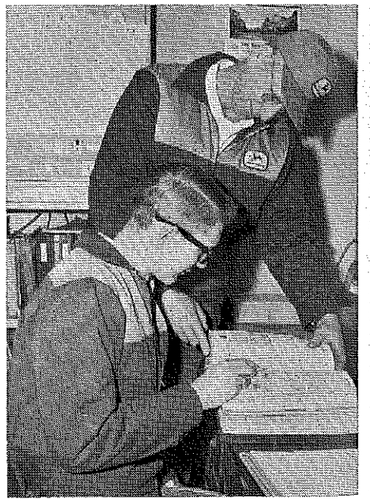
The respondents ranked their problems of implementing agricultural distribution programs in the following order of difficulty:

1. Securing qualified agricultural businesses to act as training stations for students.
2. Selecting students to participate in a cooperative occupational experience program.
3. Obtaining administrative approval and support for the program.

Without question, *the most difficult problem most agriculture teachers had to overcome was the selection of qualified training stations.* In small rural communities, agricultural businesses in sufficient numbers and variety did not exist. Teachers resorted to classroom exercises to simulate activities which approximated real-life business conditions. The teacher's rapport with adults in the community greatly influenced the likelihood of cooperation from businessmen in the community.

Factors influencing the difficulty in securing training stations are given in Table 1. The seasonalness of many agricultural businesses increase the difficulty in providing employment opportunities throughout the semester. At least one agriculture teacher organized students who were temporarily out of a job into study groups. However, most states specify a minimum number of hours students must be employed per week to receive credit for their occupational experience.

Small businesses frequently use family labor and do not need extra help. In this study over half of the businesses hiring cooperative occupational students were family owned and operated. This type of ownership usually places a ceiling on the opportunity for promotions and advancement within the organization.



Training station managers must spend time with student-employees for quality occupational experiences. Martin Graumann, owner of an implement company at El Reno, Oklahoma helps Gary Saathoff, student trainee, locate information in a manual. Gary graduated from a cooperative occupational experience class in agriculture last spring and has remained on the job while attending college. (Photo by Paul Newlin)

Training station managers need to understand the objectives of cooperative occupational experience programs. Economic pressures may tend to make the student-employee more of a worker than a learner. Vocational agriculture teachers accepting responsibilities as a coordinator of cooperative programs must place the best interests of the students first when visiting training station managers.

Clientele Served

Who are the students in need of cooperative occupational experience? More research is needed to answer this question. Teachers interviewed indicated various ways of selecting their students. Some teachers required students to have been enrolled in vocational agriculture. Others did not. Students indicated that earning money was a primary reason for enrolling in the cooperative class. Many were seeking employment soon after graduation from high school.

Other school activities interfered with the student's time to work on the job. This problem became particularly acute when the student asked employers for time from the job to participate in sports or activities.

Some students enrolled in the class to gain credit to graduate. Others wanted to learn more about a particular kind of business or skill. Students placed in agricultural businesses operated by relatives or friends were more difficult to advise as reported by the teachers than other students.

A Part of a Whole

In order for an occupational experience program to function as a part of a school system, the administrator and other teachers must be informed of its progress. It is desirable for the agriculture teacher to enlist the help of other vocational teachers, particularly those familiar with cooperative placement programs. The authors found very little evidence of coordinated and cooperative effort going on among vocational teachers in a given school program. However, the respondents did not perceive this as a problem. Almost every teacher reported good cooperation from his administrator.

Arranging the school schedule to allow time for students to participate in occupational experience programs appeared to be the greatest administrative problem.

Table 1

Average Ranking of Problems in Securing Training Stations As Perceived by the Institute Teachers[a]

Problems	Placement of Students in Business: Less than Four Students Placed (17 Departments)	Placement of Students in Business: Four or More Students Placed (11 Departments)
Wages too high	1.7	1.0
Seasonal business	3.6	3.5
Insurance on students	1.2	0.9
Reports on students	0.2	0.1
Ability of students	1.4	1.2
Labor laws for students	1.2	1.6
Extra help not needed	2.6	3.7
Employer could not understand	0.1	0.2
Resentment of employees	0.0	0.1
Students too young	0.5	0.4
Time of day students could work	2.4	2.2
Failure of students to secure Social Security number	0.0	0.0

[a]0=no problem, 5=greatest problem

Implications for Teachers

- Teacher manpower appears to be a critical factor in the establishment of quality occupational experience programs in agriculture. Teachers contemplating such a venture should expect to invest a considerable amount of time visiting students and training station managers in their businesses.
- Multiple teacher departments placed significantly more students in occupational training stations than did single teacher departments. This finding was not supported at the .05 level of significance the second year of the institute; however, the results were in the same direction.
- Teachers need to be aware of employment opportunities which are broader than their own communities in order to select appropriate training stations for students.

[1]See Bulletin No. 4 entitled *Objectives for Vocational and Technical Education in Agriculture.* OE-81011, 1966, 12 pp.

[2]The final report of the teacher education institute entitled *Developing Occupational Experience Programs in Agricultural Distribution* and/or the research bulletin entitled *Problems of Implementing Agricultural Occupations Programs in Twenty-Eight Selected Vocational Agriculture Departments* may be obtained by writing the Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma 74074.

USING RESEARCH IN TEACHING

ROBERT V. KERWOOD
Center for Vocational and Technical Education
The Ohio State University


Robert V. Kerwood

One of the most challenging and perplexing problems of the vocational agriculture teacher is the use of research in teaching. Some would suggest that research is for researchers and teaching is for teachers. However, as Hammonds so aptly stated, "Teachers of agriculture should use the results from research as a basis for their teaching whenever such results are available and applicable to the situation. Persons who lack respect for research should not teach agriculture."[1]

Certain factors affect the use of research in teaching. The meaning of research, the nature of the teacher, the nature of the student, the learning process, and the method of teaching have certain implications for teachers of vocational agriculture. The teacher's perception of research and his ultimate use of research findings will be determined by relationships and contributions of each factor.

The Meaning of Research

The meaning of research, as conceptualized in this article, stems from the desire of teachers and students to think and understand for the ultimate purpose of finding out the truth. To this end Rummel's definition of research as "a careful inquiry or examination to discover new information or relationships and to expand and to verify existing knowledge"[2] shall serve as the basis for generalization.

The Nature of the Teacher

The vocational agriculture teacher occupies a unique position in the conduct and utilization of research. Agriculture teachers traditionally conduct research dealing with a varicty of program oriented problems. Too often this "research has been limited to what graduate students do in preparation for their degrees."[3]

The contributions of vocational agriculture teachers as essential links between the agricultural experiment stations and farmers—future, young, and adult—have led to U. S. agricultural production records unequalled in the world. The concept in this linkage system is being studied with profound interest by educational researchers.

However, program oriented research and the dissemination of experiment station recommendations do not encompass all the pertinent factors. Research pertaining to students, the learning process, and teaching methods also needs to be considered.

The Nature of the Student

The vocational agriculture student is a complex social being with certain needs and interests which must be fulfilled. The attitudes, appreciations, and ideals which influence the behavior of students must be recognized by the teacher in order to develop skills, abilities and understandings.

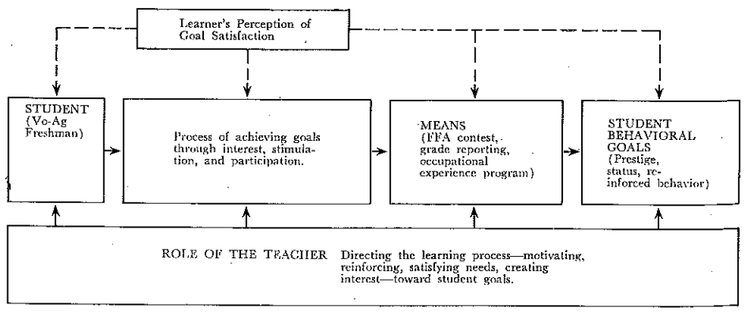
Behavioral or psychological research must be encouraged if teachers of vocational agriculture expect to achieve optimum development of each individual student. To ignore the needs and interests of students leaves the teacher an inadequate base for effective instruction.

The Learning Process

How does a student learn? What system of experiences are needed by the learner? What is the role of the teacher in the learning process? Such questions are indeed researchable and important to the teacher of vocational agriculture.

As shown in Figure 1, students learn through the process of achieving goals. These goals take their form in prestige, status, and reinforced behavior.

Figure 1
A System of Learning



[1]Hammonds, Carsie *Teaching Agriculture* (New York: McGraw-Hill Book Company, Inc., 1950), p.68.
[2]Rummel, J. Francis *An Introduction to Research Procedures in Education* (New York: Harper and Row, 1964), p. 2.
[3]Bender, Ralph E. "Teacher Preparation for Vocational Education," *Theory Into Practice*, Vol. III, No. 5 (December, 1964, Columbus, Ohio: The Ohio State University).

The learner's perception of goal satisfaction may be realized through such activities as an FFA contest, grade reporting, or increased profits from an occupational enterprise. Regardless of the system, there must be interest, stimulation, participation, and the achievement of desirable behavioral goals.

The implications of the concepts presented in Figure 1 are that more research on the learning process is needed in vocational agriculture. Further, the teacher of vocational agriculture needs to know as much about the behavioral growth of students as he does about growing corn.

Research and Methods of Teaching

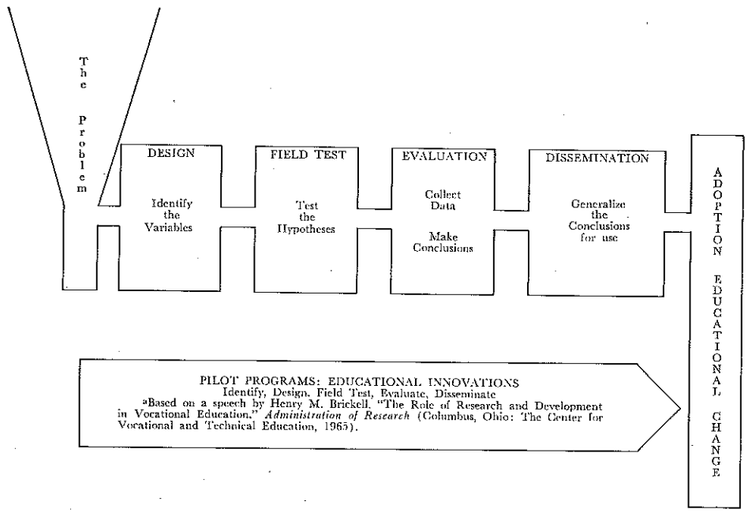
Vocational agriculture has been characterized by the scientific method of teaching. Although terms such as problem solving and creative learning have been assigned to the concept, the basic characteristics have centered around sensing problems, forming ideas, testing and modifying these ideas, and communicating the results.[4]

Do students learn more through the problem solving process than other methods? What are the other methods of learning which could be used in vocational agriculture classes? It is somewhat paradoxical to find that "little has been done to develop teaching methods on the basis of scientific knowledge of learning."[5] In aeronautical terms one might say that in reference to learning we are "flying by the seat of our pants."

Factors such as motivation, reinforcement, readiness, and mediating response[6] need to be considered in the learning process. A system by which other learning variables can be identified, tested, evaluated, and the results disseminated is needed if research on the methods of teaching is to effect educational changes. Such as system is presented in Figure 2.

As shown in Figure 2, the vehicle for testing an educational innovation

Figure 2
A Model for Research in Teaching[a]



[a]Based on a speech by Henry M. Brickell, "The Role of Research and Development in Vocational Education," *Administration of Research* (Columbus, Ohio: The Center for Vocational and Technical Education, 1965).

is the pilot program. An example of such an innovation would be a new method of learning (operant conditioning). Individualized instruction as a method of teaching would be pilot tested and compared to control classes. If the idea has application to vocational agriculture, demonstration classes could be used for inservice training of teachers in various districts in the state.

Implications for Teachers

Respect for and involvement in research must be a part of the vocational agriculture teacher. He must know his agriculture (subject matter) and the skills of his profession (teaching). To ignore either issue reduces his effectiveness. The vocational agriculture teacher needs empirical data on agricultural technology *and* the learning process.

The teacher's perception and use of research findings play a key role in the success of a vocational agriculture program. It is therefore imperative that the teacher of vocational agriculture recognize certain implications from using research in teaching. The following concepts have implications for teachers of vocational agriculture:

- Teachers of vocational agriculture should conduct research and utilize research findings in the teaching-learning process for the maximum development of students. An example would be the use of an eight millimeter movie projector in combination with a tape recorder to measure learning and retention in a unit lesson on corn production as compared to a control group not using the projector or tape recorder.
- Teachers of vocational agriculture should develop student competencies in the six steps of the scientific method of research. An example would be the teaching of a unit based on a problem encountered by a student such as "What is the most economical feedstuff for the baby beef enterprise?"
- Teachers of vocational agriculture should involve students in the act of research. An example: A student survey to determine acres of corn grown last year.
- Teachers of vocational agriculture should conduct research studies which contribute to the success of their teaching. A study of teaching methods used in their districts would be an example.
- Teachers of vocational agriculture should cooperate in pilot projects conducted by educational researchers. An example would be serving as a pilot school in testing various learning

(Continued on page 203)

[4]Torrance, E. Paul *Creativity* (Washington, D.C.: National Education Association, 1963), p. 4.
[5]Wallen, Norman E. and Robert M. W. Travers "An Analysis and Investigation of Teaching Methods," *Handbook of Research on Teaching*, N. L. Gage, Ed. (Chicago, Illinois: Rand McNally and Company, 1963), p. 465.
[6]*Ibid* pp. 487-488.

Farm Labor Management — What is Important?

RONALD D. BEAVER, Teacher, Atlantic, Iowa

and

C. E. BUNDY, Teacher Education, Iowa State University

What are the important understandings and abilities needed by farmers to utilize effectively their own labor, family labor, and hired labor? Do farmers consider effective management of labor important to their farming operations? If so, do they possess the necessary competence in labor management?

Ronald D. Beaver

This article is based on a study conducted by Ronald D. Beaver, "Competencies in Farm Labor Utilization Needed by Farmers", M.S. thesis, 1967. Iowa State University, Ames.

C. E. Bundy

Competencies In Labor Management

To answer these questions, an instrument listing forty-nine competencies pertaining to the utilization and management of farm labor was developed with the assistance of farmers, vocational agriculture instructors, and specialists at Iowa State University. Fourteen of the competencies were classified as understandings while the remaining thirty-five competencies were listed as abilities. The instrument was mailed to 399 Iowa farmers selected at random and to 250 farmers selected by vocational agriculture instructors as efficient managers of labor. Each farmer was asked to indicate the degree he possesses and the degree he needed each competency listed on the questionnaire.

Both the randomly selected group of farmers and the selected group of efficient farmers indicated a relatively high degree of competence was needed for the understandings and abilities listed in Table 1. Both groups of farmers rated high the need for understanding *the importance of timeliness of operations in crop and livestock production* and for understanding *when the time of the farm operator is more profitably utilized in management activities than as labor.* In addition to the items listed in Table 1, efficient farmers indicated that much competence was needed in understanding *employer responsibilities for social security, withholding taxes, insurance,* and *compliance with regulatory laws relating to hired workers.*

Both groups of farmers ranked highest the need for ability to *recognize conditions and circumstances requiring immediate attention and labor* and the ability to *anticipate and prepare for peak work loads in the farm work schedule.* Generally, the degree of competency needed was ranked higher for the items pertaining to abilities than for the items pertaining to understandings.

In addition to the abilities listed in Table 1, the group of farmers designated as efficient managers of labor indicated that much competence was needed in the ability *to plan the daily work schedule in advance,* the ability *to figure costs and returns from using machinery to save labor,* and the ability *to select power and machinery suited to a farm to accomplish work economically and on time.* Also, the randomly selected group of farmers indicated that competence was needed in the ability *to judge qualifications of prospective hired workers* and in the ability *to make definite agreements with hired workers about working conditions.*

Need for Instruction

Figure 1 indicates that neither the randomly selected farmers nor the farmers selected as efficient managers of labor indicated that they possessed competencies to the extent that the competencies were needed. The efficient farmers indicated that they both needed and possessed competencies pertaining to farm labor utilization to a greater degree than did the randomly selected group of farmers.

Each of the forty-nine competencies was rated to be necessary for the effective utilization of farm labor. Relatively large differences between the degree of competence needed and the degree of competence possessed were indicated for seven of the items for farmers classified as efficient managers and for fifteen items for farmers who were selected at random.

Figure 1

Mean Scores for All Items Indicating Degree of Competency in Labor Utilization Needed and Possessed by Farmers

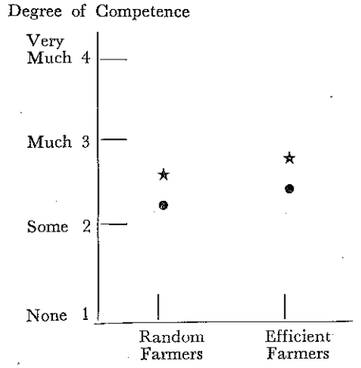


Table 1

Competencies in Labor Utilization and Management Needed and Possessed by Farmers

Competence	Degree of Competence			
	Random Farmers		Efficient Farmers	
	Needed	Possessed	Needed	Possessed
UNDERSTANDING OF:				
Costs and returns from using additional labor in each farm enterprise	★★★	★★	★★	★
Size or volume of farm business necessary to employ full-time the year around the labor available on the farm	★★★	★★★	★★	★
Importance of timeliness of operations in crop and livestock production	★★★	★★	★★★	★★
When farm-operator time is more profitably utilized in management activities than as labor	★★★	★★	★★★	★
ABILITY TO:				
Assign appropriate priorities to the farm work to be done	★★★	★★	★★	★
Recognize and emphasize the important aspects of a job	★★★	★★	★★	★
Recognize conditions and circumstances requiring immediate attention and labor	★★★	★★★	★★★	★
Anticipate and prepare for peak work loads in the farm work schedule	★★★	★★★	★★	★
Plan the cropping and livestock programs to distribute labor throughout the year	★★★	★★	★★	★★
Figure costs and returns from using farm chemicals to save labor	★★★	★★	★★	★
Arrange buildings, facilities and field layout to save labor and increase profits.	★★★	★★	★★	★
Use tillage and cropping practices and equipment which save labor and increase profits	★★★	★★	★★	★
Use livestock production practices and equipment which save labor and increase profits	★★★	★★	★★	★
Provide for repair and maintenance of farm machinery	★★★	★★	★★	★★
Observe safety precautions in general to avoid potential loss of man-hours of labor	★★★	★★	★★	★★
Give instructions to workers quickly and clearly	★★★	★★	★★	★

Mean scores for each item were calculated using the following scoring system:
0 = no competence needed or possessed; 2 = some competence needed or possessed;
3 = much competence needed or possessed; 4 = very much competence needed or possessed.

Key to symbols: Mean scores 2.0 to 2.4 = ★
Mean scores 2.5 to 2.9 = ★★
Mean scores 3.0 and above = ★★★

Some Implications

Comparisons of scores indicating the degree of competence needed with the characteristics of farmers showed that the following groups of farmers had scores indicating the greatest need for competencies in farm labor utilization:

—farmers with highest educational levels
—farmers with the most years of farm experience
—members of farm partnerships
—operators of largest acreages
—producers of livestock
—employers with the most hired and total farm labor

These relationships have important implications for vocational programs for present and prospective farmers.

Considering the results of this study, the development of competence in effective utilization of farm labor should be stressed in educational programs for farmers. The competencies in farm labor utilization identified in this study could serve as a basis for labor management instruction in agricultural education programs for high school students, young and adult farmers, in farm production and management curriculums in area vocational schools, and in colleges of agriculture.

Using Research in Teaching

(Continued from page 201)

patterns and behavioral outcomes.

- Teachers of vocational agriculture should integrate the results of studies concerning the attitudes, appreciations, and ideals which affect student learning. For example, the teacher should be aware of the increased student interest in vocations at the tenth grade level.
- Teachers of vocational agriculture should submit new ideas, or innovations, to be field tested for application to teaching vocational agriculture. An example of this would be a new teaching method which has stimulated unusual learning. It could be further tested, evaluated, and the results disseminated to other schools.
- Teachers of vocational agriculture should update their competencies through inservice education in the area of research, characteristics of teachers and students, the learning process, and methodology of teaching.

A Critique of Research in Agricultural Education

GENE M. LOVE, Teacher Education

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In the September, 1966, issue of the *American Vocational Journal,* Dr. H. M. Hamlin wrote, "Much of what we (vocational researchers) have done has been narrow, insignificant, and amateurish." The statement is worthy of careful study, especially since Dr. Hamlin, a recognized authority in the field, has devoted his life to vocational education.

My first reaction to Dr. Hamlin's statement was negative. I remember asking myself how we could deserve such strong criticism. We manage to complete a considerable amount of research each year in a variety of problem areas. It does not seem reasonable that our work should be termed narrow, insignificant, or amateurish. Consequently, I decided to make an objective analysis, in so far as possible, of the research in agricultural education in the North Atlantic Region during 1964-1966. Perhaps this was the purpose of Dr. Hamlin's remark. In any case, a critical review of our research is in order.

Research Emphasis Expanding

We have more research studies in progress than ever before. In fact, we have more researchers than ever before. Further expansion of research in agricultural education will depend, in part, upon the results of our present efforts. Therefore, it is logical that we should ask: What is the nature of our research? Are we narrow and amateurish? Is much of what we do insignificant? Let's take a look at the 103 studies completed in the North Atlantic Region during 1964-66. The abstracts from which the data were taken were prepared by the Research Committee, Agricultural Education Division, AVA.

Although the data and the analysis which appear in the four tables may not be entirely adequate, the results do offer some objective evidence of the status of research in the Region. And, to the extent that the North Atlantic Region is similar to other Regions, the results may be generalized.

Quantity of Research

The number and per cent of studies by type are reported in Table 1. Sixty-nine studies, roughly two-thirds of all studies reported during the two year period, were master's degree theses, papers, and essays. Twenty studies, approximately one fifth of the total, were doctoral dissertations. Only thirteen studies were reported by faculty researchers.

Table 1

Studies in Agricultural Education Completed in the North Atlantic Region, 1964-66

Type of Study	Number	Per Cent
Staff	13	13
Doctoral	21	20
Masters	69	67
Total	103	100

At least in terms of numbers, there is little reason to apologize for the research we are doing. On the other hand, we might ask if thirteen staff research studies in two years is sufficient evidence to indicate a significant faculty involvement in research? We have over twice this number of faculty in the Region. Nevertheless, the question which Dr. Hamlin has raised about the quality of our research still remains.

Areas of Research

Table 2 summarizes the number and per cent of research studies completed during 1964-66 by problem area. Forty-two studies concerned some aspect of guidance, thirty-one investigated administrative problems, nineteen reported results dealing with the curriculum, and eleven researched adult education problems.

Table 2

Problem Areas of Studies in Agricultural Education in the North Atlantic Region, 1964-66

Problem Area	Number	Per Cent
Guidance	42	41
Administration	31	30
Curriculum	19	18
Adult Education	11	11
Total	103	100

The large number of occupations studies conducted during 1964-1966 explains the popularity of guidance studies. Administrative studies were also popular. Efforts to define and outline new programs attracted much attention. Course of study and instructional materials studies have only recently begun to increase in number. It is surprising that only eleven studies investigated adult education problems. The number is small when we consider the added importance some educators are placing on post-high school vocational education. Since research efforts usually accompany the expansion of educational programs into new areas of emphasis, it seems likely that more problems will focus upon post-high school issues as area technical schools and junior colleges offering vocational education grow in number.

Methods and Techniques of Research

A review of the methods and statistical techniques used in the 103 studies completed in 1964-66 appears in Tables 3 and 4. Only eight per cent of the studies were experimental.[1] Another six per cent were pre-experimental. Thirty-nine per cent were simple surveys. Half of the experimental studies were conducted by faculty members. The doctoral researchers seemed to prefer the causal-comparative approach although six earned their doctorates with surveys. As might be expected, the vast majority of the surveys, both sampling and simple, were the result of master's degree studies.

Fifteen per cent of the studies used no statistical technique to define and describe their findings. Forty-five per cent used non-parametric statistics such as frequency counts, chi square, median, and rank order correlations. Forty per cent employed parametric statistics including such techniques as the mean, standard deviation, Pearson correlation, t test, F test, covariance, or factor analysis.

[1]Gage, N. L. *Handbook of Research on Teaching.* Chicago: Rand McNally & Company, 1963. p. 171 ff.

Gene M. Love

Dr. Gene M. Love is Associate Professor and Chairman, Department of Agricultural Education, University of Missouri. Dr. Love was formerly a member of the staff of the Department of Agricultural Education, The Pennsylvania State University. *This article is from a paper presented by Dr. Love during the North Atlantic Regional Research Conference held at Rutgers—The State University, New Jersey, November 1966.*

Table 3

Method of Research Used in Studies in Agricultural Education in the North Atlantic Region, 1964-66

Method	Number	Per Cent
Experimental	8	8
Pre-experimental	6	6
Causal-comparative	40	39
Sampling surveys	22	21
Simple surveys	27	26
Total	103	100

Researchers in the North Atlantic Region have used a variety of research methods and statistical techniques. For most studies it would not appear that the methods and techniques are either insignificant or amateurish. Nonetheless, there are some rather obvious areas of needed improvement.

Table 4

Statistic (Classified by Highest Level)[a] Used in Studies in Agricultural Education in the North Atlantic Region, 1964-66

Level of Statistic	Number	Per Cent
None	16	15
Non-parametric[b]	46	45
Parametric[c]	41	40
Total	103	100

[a]Siegel, Sidney. *Nonparametric Statistics for the Behavioral Sciences.* New York: McGraw-Hill Co., 1956.

[b]Includes tests of values from the nominal and ordinal scales such as frequency counts, chi square, median, and rank order correlations.

[c]Includes mean, standard deviation, Pearson correlation, t test, F test, and covariance.

A Word About Methodology

Experimental and pre-experimental studies are "forward looking". They begin at a point in time and proceed in a forward direction. However, only true experimental studies provide adequate controls and comparison groups to permit meaningful generalizations of findings.

Causal-comparative studies, sampling surveys, and simple surveys are all "backward looking" research methods. They proceed backward from a point in time, searching for relationship among variables and/or asking frequency questions about events which have already occurred and which may not have been carefully controlled. Causal-comparative studies use somewhat more refined statistical techniques. Consequently, the studies are usually more refined.

Surveys. Sampling surveys are used extensively in market research. The value of findings which come from such surveys are based on large samples which have been carefully drawn and on the accuracy of information obtained by means of a valid instrument in the hands of an experienced interviewer. The simple survey is a quick means of securing information, usually by means of a questionnaire and frequently without proper sampling procedures.

Researchers in agricultural education have too often accepted the simple survey as a substitute for the sampling survey. Almost half of the studies reported in the Region were surveys. Substitution of the interview techniques for the questionnaire would, in many cases, have increased the confidence limits of the data.

Causal-comparative studies. The causal-comparative method of research has grown in popularity during the past several years. The method is particularly useful where variables cannot be satisfactorily controlled through experimentation or where time and expense do not permit a more objective evaluation. The method has considerably more value than we have found for it in agricultural education.

Experimental studies. There should be no question that experimental studies yield more useful research results than other methods of research. This is not to say that we have no use for the survey and causal-comparative methods. The experiment involves the researcher in the "events" of his research. He can measure, analyze, and evaluate only after he has planned, controlled, and observed the events of his investigations. Those events, for example, may constitute the development of an instructional unit or the formulation of a new teaching method. In which case the units or the method becomes a vehicle for conducting research. The vehicle has immediate application while providing the researcher with a means of experimentation.

The experiment permits the researcher to make an educational contribution while pursuing a scientific evaluation of worthy variables. Thus, the researcher can satisfy both the needs of field workers who ask for applied research and the faculties of Graduate Schools who insist that their members conduct original research.

Summary

Obviously, it is not possible to draw specific conclusions about the research in agricultural education in the North Atlantic Region. The data do not justify such conclusions. Nevertheless, there is ample evidence to indicate that much of what we do is worthy research. It does not deserve to be called narrow, amateurish, or insignificant. On the other hand, we cannot deny that (1)) considerably more staff time could be devoted to studies of greater magnitude, (2) the use of experimental studies could be expanded, (3) the simple survey (unsampled using a questionnaire) should be limited, and (4) parametric statistics could be used more frequently to improve the confidence limits of our research findings.

Research in Agricultural Education:

STUDIES COMPLETED IN 1966-67

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The future progress of agricultural education depends to a large extent upon the wise direction of research and upon adequate dissemination of the research results. Agricultural educators realize the importance of making pertinent research findings available as quickly as possible to provide a sound basis for making essential adjustments in current programs and for developing new programs.

The Research Committee of the Agricultural Education Division of the American Vocational Association compiles annually in mimeograph form abstracts of studies completed in each of the four regions. A limited number of copies of the studies completed in 1966-67 may be obtained from: J. R. Warmbrod, The Ohio State University, Central Region; R. A. Baker, Auburn University, Southern Region; C. O. Loreen, Washington State University, Pacific Region; and David F. Shontz, University of Rhode Island, North Atlantic Region.

The abstracts provide a brief statement of the purpose, method, and findings of research. They include information on where to obtain the thesis or published report. Doctoral theses may be purchased on microfilm. Master's theses are available on inter-library loan. The availability of abstracts of research in agricultural education through the ERIC Clearing House on Vocational and Technical Education is indicated on the next page.

Eleven major categories have been utilized in classifying the titles reported in 1966-67. The number of studies indicates a continuing emphasis on student occupational opportunities and educational needs in agriculture. Other areas receiving considerable attention included student personnel services, learning processes and teaching methods, evaluation, and teacher education.

David F. Shontz

This compilation of research in agricultural education is a project of the Research Committee of the Agricultural Education Division, American Vocational Association. Dr. David F. Shontz, the representative of the North Atlantic Region on the Research Committee, is Assistant Professor of Agricultural Education, University of Rhode Island.

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ABSTRACTS OF RESEARCH IN AGRICULTURAL EDUCATION

The U.S. Office of Education has discontinued the publication of the series *Summaries of Studies in Agricultural Education,* Vocational Division Bulletin No. 180, Agricultural Series No. 80, U.S. Department of Health, Education, and Welfare. Supplement No. 16, which includes an annotated bibliography of studies in agricultural education completed during 1961-63, is the last supplement of the series to be published.

In view of the above, the Research Committee of the Agricultural Education Division, American Vocational Association, has made arrangements with the ERIC Clearinghouse on Vocational and Technical Education, The Ohio State University, for the dissemination of abstracts of research in agricultural education. Abstracts of research in agricultural education will be published in *Abstracts of Research and Related Materials in Vocational and Technical Education,* a quarterly publication of the ERIC Clearinghouse on Vocational and Technical Education. An announcement in this issue of *The Agricultural Education Magazine* indicates how this publication may be obtained.

Annual publications of "Summaries of Studies in Agricultural Education" for each region prepared by the Research Committee of the Agricultural Education Division of the American Vocational Association are entered into the ERIC system. These publications will be cited in the monthly publication of the U.S. Office of Education, *Research in Education,* and will be available for purchase from the ERIC Document Reproductive Service (EDRS) as hard copy or microfiche.

The following regional publications have been entered into the ERIC system. Notices of these publications are tentatively scheduled to appear in the May, 1968, issue of *Research in Education.*

- Abstracts of Studies in Agricultural Education, Central Region, for the Years 1963-64. (VT 004 441)
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BOOK REVIEWS

FOR MORE EFFECTIVE TEACHING by Alfred H. Krebs. Danville, Ill.: Interstate Printers and Publishers, 1967. 250 pp. $4.95.

This book explains how the vocational agriculture teacher can be more effective through the use of the problem-solving approach to teaching. The author goes into considerable detail in outlining the steps used in developing the problem-solving approach of teaching and devotes several pages to examples. As all teachers may not wish to follow the same plan, several modifications in plans are given.

The importance of developing a course of study to fit the farm and nonfarm agriculture of the school district and community is emphasized as the first step toward proper instruction. Many excellent suggestions are given. The appendices will help the inexperienced teacher considerably in developing a desirable course of study.

Adult education has not been forgotten as one chapter is devoted to the application of the problem-solving approach in teaching young farmers and adult farmers. Suggestions are given as to what changes need to be made when working with adult students.

This book should be of particular value to students preparing to teach vocational agriculture as well as those teachers wishing to improve their present teaching procedures.

Robert M. Schneider
Michigan State University

MECHANICS IN AGRICULTURE by Lloyd J. Phipps, Danville, Illinois: The Interstate Printers and Publishers, 1967, 808 pp. $5.95.

Mechanics in Agriculture can be highly recommended as a reference book for instruction in vocational agriculture. It is a book that students may wish to have as a resource after graduation. Although it has been written to relate to formal instruction, the book has value for individual study and independent work. The illustrations that have been provided through the courtesy of many have value as visual aids to supplement the procedures that are provided in the text.

There has been a very definite effort to add new developments in each area of mechanics instruction. This tends to make the volume particularly large because few areas which may seem out-of-date have been deleted. Units such as "selecting and using rope" or "repairing and preserving leather" are still included. These can be justified because many teachers work in sections of the country or in rural areas where pleasure horses are kept and rope is used for handling stock. Teachers who may have had limited experiences in these areas will find that this book is probably adequate to prepare them to teach and supervise students who may wish to work independently in their type of work.

The book follows the traditional organization of agricultural mechanics: Agricultural Shop Work, Agricultural Power and Machinery, Agricultural Buildings and Conveniences, Rural Electrification, and Soil and Water Management.

H. Paul Sweany
Michigan State University

SEMINARS AND CONFERENCES

National Outlook Seminar on Agricultural Education
Theme: Planning for a Decade of Evolution in Training for Agricultural Occupations
Date: May 6-9, 1968
Location: Hotel Sheraton-Jefferson, St. Louis, Missouri
Participants: Head supervisors and teacher educators
Program Chairman: H. N. Hunsicker
Division of Vocational and Technical Education
U.S. Office of Education
Washington, D.C. 20202

Southern Agricultural Education Conference
Theme: The Role of Professional Leaders in Agricultural Education
Date: April 8-12, 1968
Location: Jack Tar Hotel, Clearwater, Florida
Program Chairman: C. M. Lawrence
State Department of Education
Tallahassee, Florida 32304

Pacific Region Agricultural Education Seminar
Theme: Designing Vocational Agriculture for the Seventies
Date: April 16-19, 1968
Location: Cheyenne, Wyoming
Program Chairman: Percy Kirk
State Department of Education
Cheyenne, Wyoming 82001

Teaching Agricultural Occupations in Community Colleges and Area Schools
Date: March 6-8
Location: Potomac State College, Keyser, West Virginia
Date: March 20-22
Location: Abraham Baldwin Agricultural College, Tifton, Georgia
Date: April 11-13
Location: Mesa Community College, Mesa, Arizona
Date: April 24-26
Location: Treasure Valley Community College, Ontario, Oregon
Program Chairman: Howard Sidney
Agricultural and Technical College
Cobleskill, New York 12043

Program and Policy Development in Agricultural Education:

A Role For Research?

DOUGLAS C. TOWNE, University of Tennessee

Vocational education has received a great deal of attention from many sources during the past decade. Vocational agriculture in particular has been the subject of much debate and scrutiny. This concern on the part of persons not directly involved in vocational education has reinforced the efforts of those within the fields to study and effect changes designed to improve and increase the contributions of vocational studies to society in general and the individual in particular.

INFLUENCES ON CHANGE

This close scrutiny of programs and policies has resulted in many changes. Any change which takes place does so as a result of some kind of pressure or influence which has been exerted upon the original state. Two studies were conducted to obtain empirical evidence of these changes which have taken place in programs and policies in agricultural education and to identify the pressures or influences which contributed to the changes.[1]

The first study involved a content analysis of recent issues of *The Agricultural Education Magazine* (November 1966 through October 1967) to identify new programs and determine the influence or rationale leading to the change described. In the second study all head state supervisors of agricultural education were requested to identify the major policy changes which have taken place in agricultural education since 1962 and also list the influences causing the identified policy change. Supervisors from thirty-seven of the fifty states responded.

Influences Upon Program and Policy Changes

Change	Number	Type of Influence		
		Political	Research	Other
Program	28	11	2	12
Policy				
Instructional Policy	49	33	9	17
Financial Policy	15	9	0	7
Teacher Policy	7	0	0	7

As indicated in the table, twenty-eight new programs were described in *The Agricultural Education Magazine*. The reasons given for these new programs were of a political nature in eleven cases, of a research nature in two cases, other reasons were given for twelve cases, and the remaining three listed no specific reason.

Here it is plain that either research provided a very small influence in program development or the authors failed to consider mention of such an influence as important enough for inclusion in the article. In either case, it may be assumed that the role of research is not as great or as direct as some persons might desire.

A total of seventy-one policy changes and contributing influences were identified and categorized as shown in the table. The major policy changes dealt with instruction which reflected to a large degree the recent shift from education and training designed to prepare students for farming to the broader emphasis of education and training for preparation of students in the agricultural occupations. The major influences leading to these policy changes were of a political nature. Other reasons were given in a total of thirty-one instances with research being given as a reason in only nine cases.

In summary, both of these studies show a great lack of research influence on program and policy change. This is partially due to the obvious difficulty in utilizing the categories presented, i.e., clear distinction between categories was difficult. It also is obvious that the Vocational Education Act of 1963 was based to a certain extent on research interpretation and it is probable that research provided some background for the other given reasons. It remains, however, that the research influence was not of a direct or powerful nature in program development or policy change.

POSSIBLE APPROACHES FOR CHANGE

These two studies and the author's experiences in the field of agricultural education seem to present a paradox concerning the role of research. This paradox concerns the role of research in relation to the *content* of agricultural education as opposed to the *function* of agricultural education.

Most students of change in agriculture would readily agree that the teacher of vocational agriculture has played a part in transferring agricultural research results to the practitioner in the field. Agricultural research findings and recommendations are a direct and integral part of almost all instructional content presented in the agricultural classroom.

[1]The author gratefully acknowledges the assistance of Mr. James L. Long, student teacher in Agricultural Education at the University of Tennessee, in conducting these two studies.

Dr. Douglas C. Towne is Director, Occupational Research and Development Coordinating Unit, College of Education, University of Tennessee. He also is Assistant Professor in the Department of Agricultural Education.

With such a research orientation in the content of agricultural education, why is it we find such a dearth of research orientation in the function of agricultural education? The two studies discussed above indicate a very great lack of research influence in program development and policy change. Why is it that agricultural education forsakes research concerning its function after such a heavy reliance upon research in relation to its content? Is it because research does not apply to the functions of program and policy development in agricultural education? What bases *can* provide a foundation for program development and policy changes? In the remainder of this article four approaches will be considered.

Tradition. Tradition, as a procedure for the functioning of agricultural education, automatically eliminates any possibility of program development or policy change since, by definition, it maintains the status quo thereby disallowing change. If tradition is the sole basis selected, then we must function today and tomorrow as we did yesterday. Perhaps in a static society the use of tradition for program operation may be justified, i.e., we were successful yesterday, nothing has changed; therefore, we should do today as we did yesterday. The question then arises as to whether we are living in a static or a dynamic society. The more dynamic the society, the less we can rely on tradition.

Authority. With the passage of the Smith-Hughes Act in 1917, vocational education became subject to the influence of legislative authority. Vocational education, perhaps more than any other phase of education has relied heavily upon this authority for the establishment and continuance of programs and policies. Any student of the history of vocational education can readily testify to the influence of legislative authority.

Basing programs and policies upon authority is not, of and by itself, detrimental. Instead it is more a function of who serves as the authority! A "good" authority may serve well the interests of society whereas a "bad" authority may be extremely harmful. The problem then is more a matter of judging the quality of the various authorities available.

One distinct disadvantage in relying heavily upon legislative authority as the approach is the fact that legislation is generally curative (retroactive planning) rather than preventive (future planning). Seldom can legislators be sufficiently motivated to enact legislation designed to provide for the good life until there is very strong empirical evidence and pressures pointing out the ills already in existence. The 1963 Act was designed more to overcome the shortcoming of our existing vocational programs than it was to provide advanced leadership in directing our educational system.

To illustrate this lag which exists when legislative authority is the primary basis for policy change, it is necessary only to look at the changes in agriculture. Well before 1963 it was evident that the number of farmers was decreasing in the United States, that farmers were becoming more specialized, that agricultural education should change to coincide with changing times. The problem, however, was that legislators could not become enthusiastic or concerned about the matter until the symptoms became very advanced. Agricultural educators must also ask themselves when they became enthusiastic about these needed changes. Was it before or after the 1963 Act?

A certain preponderance of political influence would be expected to be evident during the recent years when consideration is given to the magnitude and intent of the 1963 Vocational Education Act. This act was expressly designed to bring about changes in vocational education. As indicated by the two studies described herein, it certainly has made at least a start in this direction.

The influence of federal legislation upon vocational education has been significant since 1917. This influence will most likely continue and also be found in the other areas of education to an ever increasing extent. It becomes important, therefore, to distinguish between enabling legislation and directive legislation. Is it desirable to base educational offerings upon strict, literal interpretation of these acts, or is it more desirable to use the acts as guides within which the professional educator may exercise his expertise? Should the legislation hinder initiation of desirable changes or should it facilitate such alterations?

It must be noted that the 1963 Act has incorporated a statement to the effect that rules, regulations and policy may be set aside temporarily to experiment with new approaches. If the agricultural education profession is adequately aware of this implication and if it is willing to capitalize upon it, then perhaps the profession will be observed providing leadership and guidance for future enabling legislation rather than directive legislation providing leadership and guidance for the profession.

Reasoning. The major shortcoming in using human reasoning, or logic, as the approach to program development and policy change is much the same as that in using authority. Here it is necessary to ask, "Whose logic or reasoning will we accept?" If two persons are given the same facts and asked to reach a conclusion based upon logical reasoning, the likelihood is that they will present somewhat dissimilar results. The degree of dissimilarity would be directly proportional to the dissimilarity of their background and experience.

It is not intended that reasoning has no place in policy change or program development — rather it is the intention here to illustrate a shortcoming of which we must be aware.

Research. A fourth possible approach to the development of new programs and policies is that of research or the scientific approach. Here again, however, are some major shortcomings.

The most obvious shortcoming, as illustrated by the two studies presented above, is that research is not considered as very important in the development of programs and policies. The reason for this negative attitude, or more appropriately, the lack of a positive attitude, towards research is difficult to identify. It could be due to lack of research upon which such changes could be based. A person could not expect policy makers to utilize research in their decision-making process if no research existed. Further, if research does exist, it may have little or no

(Continued on next page)

A Role For Research *(Continued from page 213)*

relevance to program or policy development.

Another possible shortcoming of the research approach may be attributable to the necessity of limiting that with which a specific research project can be concerned. In order to conduct research it is necessary to place restrictions on the populations involved. Perhaps these restrictions hinder a broader application of the results.

A third shortcoming of the research approach deals with the difficulty experience by the practitioner in attempting to understand and interpret research reports. It is maintained that a practitioner is a practical man and cannot be expected to understand the "theoretical jargon" of the researcher.

This is hard to accept when the strong reliance on research in the content of agricultural education is considered. Is educational research so different from agricultural research that the transition is impossible? If the answer is yes, then does it hold that this is the way it has to be? Are the researchers, concerned with the functions of education, introducing hurdles that keep their research from being applied to policy and program development?

Another important factor to consider is the quality of research. Too often it is found that people accept recommendations solely because they are tied closely to something called research. Just as there are good and bad authorities, there are good and bad researchers and research projects. Perhaps the lack of research influence stems from a critical review of research findings indicating major shortcomings or invalidity in the research itself. It could certainly be argued that basing program and policy changes on educated guesses is better than basing them on inaccurate and incomplete research.

SUMMARY

The discussion of the four approaches to policy and program development does not exhaust the possible approaches, nor does it consider all aspects of each approach, and neither does it intend to indicate that the approaches are mutually exclusive. The purpose was to explore these approaches primarily to identify the shortcomings of relying primarily upon one to the exclusion of the others.

It is further maintained that the almost complete lack of the use of research in performance of the functions of agricultural education, indicated by the two studies discussed, is very incongruous with the heavy reliance on research in the content of agricultural education. It is perhaps time that the agricultural educator step back and analyze the procedures utilized in development of programs and policies. It is perhaps time that the leaders devote some major consideration to the development of formal procedures for policy formation and program improvement.

The author is of the opinion that this matter deserves extended discourse and discussion. What is the reader's opinion?

Implementing Research in Agricultural Education

(Continued from page 197)

★ Conduct inservice courses for teachers which emphasize program planning and ways to modernize agricultural education programs in meeting the educational needs for off-farm as well as on-farm agricultural occupations. Provide inservice courses in depth in "new" agricultural subject matter areas. We need to give teachers more help in modernizing their courses of study based upon research findings.

★ Conduct workshops for teachers who are planning to conduct developmental programs in agricultural occupations in addition to agricultural production.

★ Conduct one-week vocational guidance institutes for high school counselors. We have done this in Virginia the past three summers reaching over 600 counselors. We plan to continue these institutes and will extend invitations and encourage high school principals to participate also. Little can be done without the full support and cooperation of these key people in our school systems.

★ Continue to establish new pilot and developmental programs based upon research findings.

★ Continue to identify employment opportunities in agricultural occupations.

★ Continue to prepare for teachers instructional units in the "new" agricultural subject areas.

★ Prepare an adequate number of qualified teachers. Maybe we need to re-examine our teacher training programs in agricultural education.

Perhaps the limiting factors in expanding and improving the program of agricultural education continues to be dedicated and qualified teachers. We must continue our efforts to upgrade our profession by bringing into it the kind and number of men who are so greatly needed. These efforts, coupled with a sound program of research, should provide a firm basis for offering realistic instructional programs of high quality that are planned and carried out to meet the challenges facing agricultural education in the years ahead.

Studies Completed in 1966-67

(Continued from page 210)

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Themes For Volume 41

1968

JULY **Agricultural Education in Programs Involving Other Vocational Services.** Descriptions of occupational education programs that involve agricultural education and other areas of vocational education (distributive education, business education, home economics, trades and industries, vocational guidance). High school, post-secondary, and adult programs. The role of agricultural education in programs involving all vocational services. Team teaching involving the teacher of agriculture.

AUGUST **Adult Education.** New developments in adult and continuing education. Young farmer and adult farmer education. Adult education for workers in nonfarm agriculturally oriented business and industry. Instructional materials and teaching techniques for adults. Cooperative adult programs with other vocational services and non-school educational agencies. The preparation of teachers for adult programs. Professional and technical competencies needed by teachers of adults.

SEPTEMBER **Agricultural Education for Persons with Special Needs.** Descriptions of programs involving agricultural education for persons with social, economic, physical, and mental handicaps. Programs in depressed rural areas. Programs in urban and city schools. Manpower Development and Training programs. Characteristics of persons with special needs; implications for program development and conduct.

OCTOBER **Agricultural Education in City Schools.** Descriptions of programs of agricultural education in cities and urban areas. Content of instruction. Provision for laboratory and occupational experience. Characteristics of students. Adult education programs. Programs in elementary and junior high schools. Programs for students with special needs.

NOVEMBER **Supervision in Agricultural Education.** The role of the state supervisor. Recent and anticipated changes in supervision provided by state departments of education. The function of local supervisors of agricultural education. Organization and techniques for working with teachers. Responsibilities of supervisors for teacher education. Administrative responsibilities of local and state supervisors. The teacher's view of supervision. Problems and trends in supervision.

DECEMBER **Supervised Occupational Experience in Agricultural Education.** Types of supervised occupational experiences provided students preparing for farm and nonfarm occupations. Experience programs for students in business and industry. Occupational experience for students in post-high school programs. Laboratory experiences provided by the school. Relationship of occupational experience and the curriculum. Development of training plans and agreements.

1969

JANUARY **Teacher Education in Agriculture.** New developments in preservice and inservice education of teachers. Certification of teachers for new programs in agricultural education. Recruitment and selection of teachers. Teacher supply and demand. Micro-teaching in agricultural education. Innovations in student teaching. Preparation of specialist teachers for high schools, junior colleges and other post-high school institutions, and for adult education. Summer institutes. Assistantships and fellowships for 1969-70.

FEBRUARY **Agricultural Education in Area Schools.** Secondary and post-secondary programs of agricultural education in area schools. Articulation of area programs with programs in local schools. Facilities in area schools. Staffing. Provisions for occupation experience in area programs. Cooperative arrangements with other vocational programs. Student organizations in area programs.

MARCH **Student Organizations in Agricultural Education.** The changing role of FFA in agricultural education; recent and projected changes. Organizations for students in post-secondary programs. Student organizations in a program of teacher education.

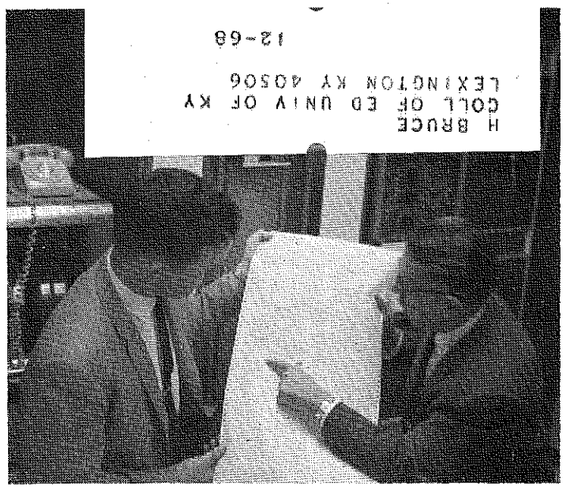
APRIL **Teaching—Instructional Materials.** New instructional materials and teaching techniques. Programed instruction. Contributions of instructional materials laboratories. Sources of instructional materials.

MAY **Curriculum Development and Program Planning.** New approaches to curriculum development and program planning. The organic curriculum. Curriculum evaluation. The development and evaluation of pilot and demonstration projects. Policy development.

JUNE **Public Information Programs; School-Community Relations.** Types of public information programs at local, state, and national levels. Means of informing and involving the public. The role of student organizations in a public information program. Advisory committees. Public information activities.

Procedure for Submitting Articles. Articles must be submitted to the Editor at least two months prior to the issue in which the article is to appear. For example, articles for the July issue must be received no later than May 1, 1968. Action photographs (with captions) that illustrate the activities and ideas presented should accompany articles. Articles should be submitted to a regional editor (see inside front cover) or to the Editor at the following address:

J. Robert Warmbrod, Editor
The Agricultural Education Magazine
The Ohio State University
208 Agricultural Administration Building
2120 Fyffe Road
Columbus, Ohio 43210

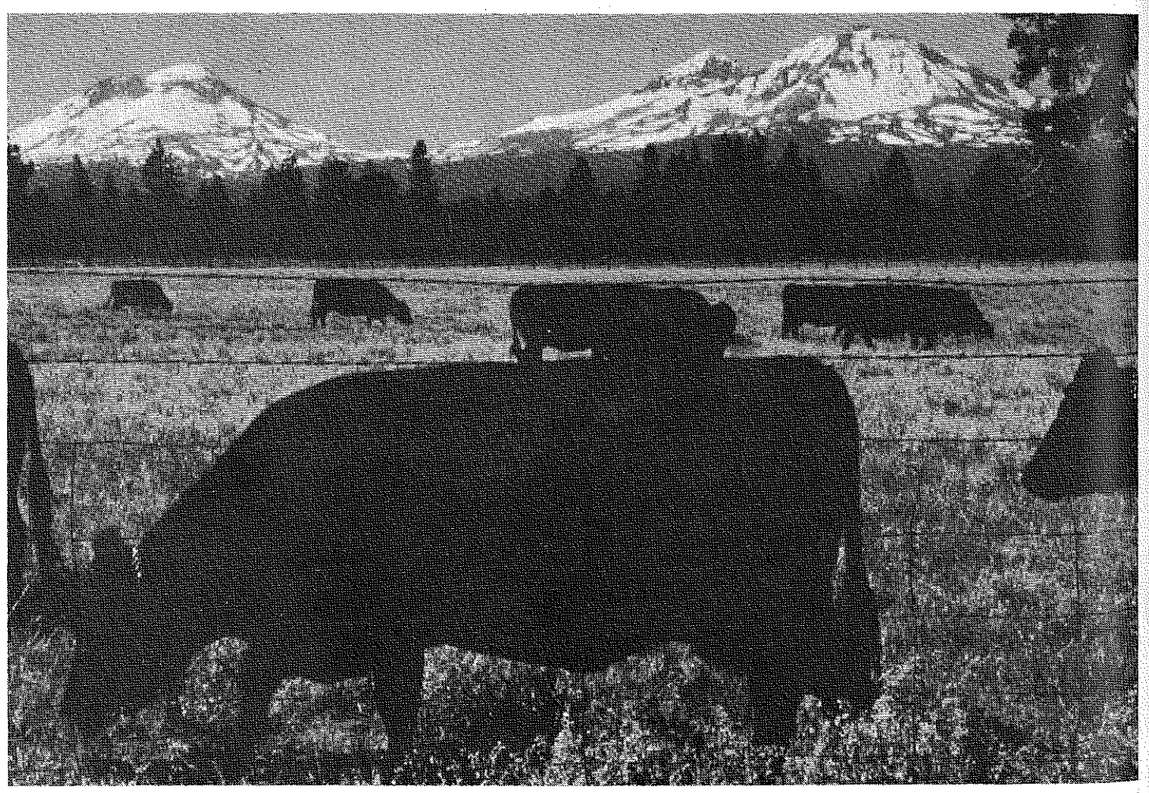


Computers play an increasingly important part in research in agricultural education. Ralph J. Woodin (right) of The Ohio State University and Warren Noland, a graduate student, examine a print-out at The Ohio State University Computer Center.

Stories in Pictures

GILBERT S. GUILER

Ohio State University



Oregon's three leading industries—agriculture, forestry, and recreational tourism—are depicted in this photograph of the mountains in Central Oregon.

AGRICULTURAL EDUCATION

Agricultural Education

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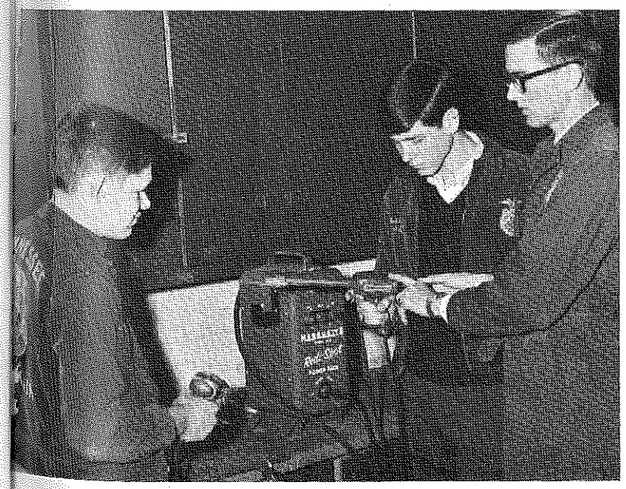

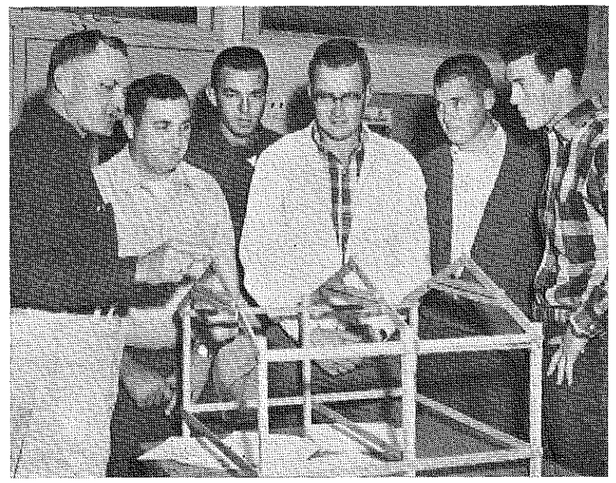

Featuring—

THE IMAGE OF VOCATIONAL EDUCATION IN AGRICULTURE