Stories in Pictures

GILBERT S. GUILER
Ohio State University

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

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

Featuring—
RESEARCH AND DEVELOPMENT
The Teacher's Role in Research

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 close 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 research. 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 is 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 person is in a position in which 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 involved and interested in research, 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 care little and actually doing less about research the majority of us today is far less great allegiance for any and all research-oriented efforts. 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 should be curious specimen indeed if they had, in effect, been sitting still while a research-oriented society passed them by.

Appreciation as a nation, we are committed to further expansion and refinement of research efforts. More and more the college of government, business, and institutional resources are being devoted to research.

(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 is only an initial step, but also a difficult task. To perform this task well, the teacher must have a thorough knowledge of the purposes and possibilities of scientific education in agriculture. The problem-solving task of teacher 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 to be used, and the feedback of ideas tested, a privilege rarely afforded the researcher.

Teachers with proper direction and guidance are capable of performing research. Any review or evaluation of research in agricultural education reveals that most of the research reported is conducted by graduate students, almost all of whom are forced 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 and should be concerned as to whether teachers in our schools and post-high school institutions, administrators and supervisors in state departments of education, or teacher educators.

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 caliber 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 will need 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 personae to protected situations for the production of quality research. They will need 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.

Implementing Research in Agricultural Education

JULIAN M. CAMPBELL, Supervision Virginia Department of Education

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 successful. Administrators who have been involved in research will certainly have given attention because of efforts to define and outline new programs.

Research is needed to determine teaching procedures effective in changing student attitudes 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 come of first concern. Evaluation is especially important in light of the "cold prod" 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 programs and the potential for growth of this could lead to pilot programs to determine the "real" or practical value of the research findings. The establishment of clearing-houses of ERRC and Regional Research Centers should be inevitable 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 feasibility of adopting or piloting 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 will have little or no value unless used. They will not be used when reported in "scientific" language. Many teachers read the "teacher's edition" of the newspaper because they know they will have a simpler and more direct interpretation of the reading by the reader. A popular style of writing would help in this respect.

* User research committees to report the findings of significant research and to suggest areas in which their work should be amplified. 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)
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

Program development for off-farm agricultural occupations grew out of 1963 vocational education legislation. Program objectives were set, and a revised and supervised practice was included to occupy occupational experiences in agricultural businesses. Money from section 4 (c) of P.L. 88-210 supported a teacher education institute at Oklahoma University. A cooperative program was designed to teach cooperative skills to vocational agriculture teachers. Participants in this institute were encouraged to initiate and 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.

Data were collected by personal interviews with twenty-eight vocational agriculture teachers in ten states from three to five months after they attended the six-weeks institute in off-farm agricultural distribution. Most of the items on the interview schedule were constructed responses. However, voluntary comments from the teachers left impressions of their feelings towards the program.

Findings of the Study

The respondents ranked their problem 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 that 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 stimulate activities which influenced the likelihood of cooperation from businessmen in the community. Factors influencing the difficulty in securing training stations are given in Table 1. The smallness of many agricultural businesses increases the difficulty in providing employment opportunities for students 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.

### Table 1

<table>
<thead>
<tr>
<th>Program Problems</th>
<th>Less than Four Students Placed</th>
<th>Four or More Students Placed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage too high</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Seasonal business</td>
<td>3.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Insurance on students</td>
<td>1.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Reports on students</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Ability of students</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Labor laws for students</td>
<td>1.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Extra help not needed</td>
<td>2.6</td>
<td>3.7</td>
</tr>
<tr>
<td>Employer could not understand</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Remuneration of employees</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Students too young</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Time of day students could work</td>
<td>2.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Failure of students to secure Social Security number</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

*0 = no problem, 5 = greatest problem*

Ninety percent of holders cooperated with students supplied by professors and operated the type of business engaged in the cooperating enterprise. Some students moved to the class to gain credit or graduate. Others were more interested in a particular type 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 administration and other teachers must be informed of its growth. It is desirable for the agriculture teacher to enlist the cooperation of other vocational teachers, particularly those familiar with cooperative placement programs. The author found very little evidence of coordinated and cooperative effort going 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.

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.

- Student placement has been facilitated through the placement of significantly more students in occupational training stations than did the teacher departments. This finding was not supported at the 0.05 level of significance the second year of the study; 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.

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MARCH, 1968

198
USING RESEARCH IN TEACHING

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

One of the most challenging and perplexing problems of the vocational agriculture teacher is the use of research in teaching. Some would suggest that the problem is how much is for research 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."

Certainly factors affect the use of research in teaching. The nature of the 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 perceptions 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, 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 Brunswik's definition of research as "a careful inquiry or examination to discover new information or relationships and to expand and to verify existing knowledge" 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. Agricultural teachers traditionally conduct research dealing with a variety of program-oriented problems. Too often this research has been limited to what graduate students do in preparation for their degree.

The contributions of vocational agriculture teachers as essential links between the agricultural experiences 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 experimental 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 research 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 on 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 form in prestige, status, and reinforced behavior.

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

The implications of the concepts proposed 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 proving problems, forming ideas, testing these ideas, and communicating the result.

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? Is it somewhat paradoxical to find that little has been done to develop teaching methods on the basis of scientific knowledge of learning? In aeronautical terms, we may ask if we are "flying by the seat of our pants."

Factors such as motivation, reinforcement, readiness, and mediating response 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 a system is presented in Figure 2.

As shown in Figure 2, the vehicle for testing an educational innovation 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 in-service 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 perceptions 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 a 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 vocational problem encountered by a student such as "What is the most economical method of feeding the baby beef enterprize?"
- Teachers of vocational agriculture should involve students in the act of research. An example: A student survey to determine acres of corn planted each 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 such a project.
- Teachers of vocational agriculture should cooperate in pilot projects sponsored by educational research agencies. An example would be serving as a pilot school in testing various learning (Continued on page 203)
FARM LABOR MANAGEMENT—WHAT IS IMPORTANT?

RONALD D. BEAVER, Teacher, Atlantic, Iowa

and

C. E. BUNYI, 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 operation? If so, do they possess the necessary competencies in labor management?

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 were classified as abilities. The instrument was mailed to 339 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 to which he possesses the competencies on the questionnaire.

Both the randomly selected group of farmers and the selected group of efficient farmers indicated a relatively high degree of competencies 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 most 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 employee responsibilities for social security, withholding taxes, insurance, and compliance with regulatory laws relating to hired workers.

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.

Competencies in Labor Utilization and Management Needed and Possessed by Farmers

<table>
<thead>
<tr>
<th>Competency</th>
<th>Random Farmers</th>
<th>Efficient Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of Competence</td>
<td>Needed</td>
<td>Possessed</td>
</tr>
<tr>
<td>Needed</td>
<td>Possessed</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>Urban</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1**

**UNDERSTANDING OF:**

- Cost and returns from using additional labor in each farm enterprise
- Size or volume of farm business necessary to employ full-time the farm labor available on the farm
- Importance of timeliness of operations in crop and livestock production

**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 labor 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

**Figure 1**

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

<table>
<thead>
<tr>
<th>Degree of Competence</th>
<th>Random Farmers</th>
<th>Efficient Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needed</td>
<td>Possessed</td>
<td></td>
</tr>
<tr>
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<td>Urban</td>
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</tr>
</tbody>
</table>

Some Implications

Comparisons of scores indicating the degree of competency 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 higher educational levels
- Farmers with the most years of farming experience
- Members of farm partnerships
- Owners of largest acreages
- Farmers 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 the 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, junior farmers, and farm families, in farm production and management curricula 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 must 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 vocational programs at the high school level.

- Teachers of vocational agriculture should submit new ideas, innovations, and techniques 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 to keep abreast of new educational influences in the area of research, characteristics of teachers and students, the learning process, and methodologies of teaching.
A Critique of Research in Agricultural Education

GENE M. LOVE, Teacher Education
University of Missouri

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, 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, and amateurish. Consequently, I decided to make an objective analysis, 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 research studies than ever before. Further expansion of research in agricultural education will depend, in part, on the university's ability to carry out the expanding 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, A.V.A.

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-two studies, approximately one fifth of the total, were doctoral dissertations. Only thirteen studies were reported by faculty researchers.

The large number of occupational studies conducted during 1964-1966 explains the popularity of guidance studies. Administrative studies were also popular. Efforts to define and outline new programs and to assess their effectiveness are of course in line with research needs. So, too, are course studies and instructional materials. These efforts 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 and unusual emphases, it seems likely that more problems will focus on post-high school issues as area technical schools and junior colleges develop vocational education 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. Another six per cent were pre-experimental. Two-studies covered some aspect of guidance, thirty-one investigated administrative problems, nineteen reported results dealing with the curriculum, and eleven researched adult education problems.

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, many true experimental studies provide adequate controls and comparison groups to permit meaningful generalizations of findings. Causal-comparative studies, sampling surveys, and so on, are referred to as "backward looking" research methods. They proceed backward from a point in time, searching for relationships among variables and for asking frequency questions about events which have already occurred and which may not have been carefully controlled. Causal-comparative studies use some, what 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 is 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 the completion of the questionnaire without proper sampling procedures. When 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 technique for the self-reporting type of survey would, in many cases, have increased the confidence limits of the data.

Causal-comparative studies. The number of research studies has grown in popularity during the past several years. The method is so flexible that results obtained by the method cannot be satisfactorily controlled through experimentation or where time, money, or some other objective evaluation is involved. The method has considerably more value than we have assigned it in our 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 experimental involves the researcher in the "events" of his research. He can measure, analyze, and evaluate only after he has planned, designed, and conducted the events of his investigations. These, for example, may constitute the development of an instructional unit or the formulation of a new teaching method. In which case the unit or the method becomes the "events" of his research. The vehicle has immediate application while providing the researcher with an opportunity to control his environment.

The experimental permits the researcher to make an educational experiment, to pursue a line of research, to describe their findings. Forty-five per cent used non-parametric statistics such as frequency counts, chi square, median, and rank order correlation. Forty per cent employed parametric statistics including the mean, standard deviation, Pearson correlation, t test, F test, covariance, or factor analysis.

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 "amateurish." In conclusion, 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, A.V.A.
Research in Agricultural Education:

STUDIES COMPLETED IN 1966-67

DAVID F. SHONITZ, Teacher Education
University of Rhode Island

PHILOSOPHY AND OBJECTIVES


OCCUPATIONAL OPPORTUNITIES AND EDUCATIONAL MAJORS

BEAVEN, KONALD D., Opportunities in Agriculture Education. Circular No. 318, U.S. Department of Agriculture, Washington 25, D.C. 1967, 7 p. Inter-library loan. The availability of this report under the title "Occupational Opportunities in Agriculture" has been indicated on the previous 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 personnel development and educational opportunities as a means of attracting and retaining pupils in agriculture and related fields.

FEEDBACK FROM STUDENTS

This compilation of research in agricultural education is a project of the Research Committee on the Agriculture Education of the North Atlantic Region, in association with the Professional Education Association of the North Atlantic Region.

GEORGE, DOUGLAS A., Annual Estimated Replacement Farm Opportunities for Degree-Holding Agriculture Majors. Paper, 1967 University of Nebraska, 10 p. Library, University of Nebraska, Lincoln.


SANDERS, CARROLL, Follow-up Study of Agricultural Education Majors in New Mexico. Thesis, M.S., 1967, New Mexico State University, 52 p. Agricultural Education, College of Agriculture, New Mexico State University, Las Cruces.


This compilation is made on the basis of an abstract of 401 studies in agricultural education completed during 1966-67, which 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 of Schools, has arranged for 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 announced in this issue. In the monthly publication of the U.S. Office of Education, Research in Education, and will be available for purchase from the ERIC Document Reproduction 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 Year 1965-66. (VT 004 441)

• Abstracts of Studies in Agricultural Education, Central Region, for the Year 1966-67. (VT 004 442)

• Abstracts of Studies in Agricultural Education, Western Region, for the Year 1965-66. (VT 004 443)

• Abstracts of Studies in Agricultural Education, Western Region, for the Year 1966-67. (VT 004 444)

• Abstracts of Studies in Agricultural Education, Southern Region, for the Year 1964-65. (VT 004 445)

• Abstracts of Research Studies in Agricultural Education, Southern Region, for the Year 1965-66. (VT 004 446)

• Abstracts of Research Studies in Agricultural Education, Southern Region, for the Year 1966-67. (VT 004 447)

• Abstracts of Research Studies in Agricultural Education, Southern Region, for the Year 1967-68. (VT 004 448)

• Abstracts of Research Studies in Agricultural Education, Southern Region, for the Year 1968-69. (VT 004 449)

• Abstracts of Research Studies in Agricultural Education, Southern Region, for the Year 1969-70. (VT 004 450)

CURIUML DEVELOPMENT

DEITZER, TRUMAN L., Agriculture Recruitment and Retention in the Purdue Agriculture Center. Masters' Report, M.S., 1967, Kansas State University, 28 p. Library, Kansas State University, Manhattan.


GLEASON, WILLIAM J., Experiences of Industry Agriculture to the Agricultural Education curriculum. Paper, 1967, Oklahoma State University, 36 p. Library, Oklahoma State University, Stillwater.

LAMONT, RALPH W., The Identification of a Basic Animal Science Course for the Enzyme Education in Science for the High School Classroom. Paper, 1967, Oklahoma State University, Stillwater.

BOOK REVIEWS


This book explains how the vocational agriculture teacher can be more effective in teaching 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 of how all teachers may not wish to follow the same plan, several modifications in plans are given.

The book describes 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 be helpful to in-service teacher concerned 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 youth farmers, adult farmers. Suggestions are given as to what changes need to be made when working with adults.

This should be available to students preparing to teach vocational agriculture and will as well as those teachers wishing to improve their present teaching procedures.

Robert M. Anderson, Michigan State University


Mechanics in Agriculture can be highly recommended as a reference book for instruction in vocational agriculture. The author has written this book to have a useful reference after graduation. Although it has been written to aid beginning students, it also has value for individual study and independent work. The illustrations that have been provided through the courtesy of many have been as chucked with over 50 illustrations of the textbook. The book is probably adequate to prepare them to teach supervisory and student who may wish to work in agriculture independently in their type of work.


H. Paul Stevanye, Michigan State University

SEMINARS AND CONFERENCES

National Outlook Seminar on Agricultural Education Theme: Planning for a Decade of Training in Education 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. Huntiker State Department 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-T-Box Hotel, Clearwater, Florida State Chairman: C. M. Lawrence State Department of Education Tallahassee, Florida 32304

Pacific Region Agricultural Education Seminar Theme: Designing Vocational Agriculture for the Seventies Date: March 22-25, 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 Program: Hebrew College, Tilton, Georgia Program: Treasurer Valley Community College, Marietta, Ohio Program: Hebrew College, Cheyenne, Wyoming 82001 School: The Agricultural Education Magazine March, 1968
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 the public not only has involved vocational education but has even led vocational education to reinforce 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, even 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.

The 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 impact or rationale leading to the change described. In the second study all head state supervisors of agriculture in the United States were asked to identify the major policy changes which have taken place in agricultural education since 1965 and also list the influences causing the identified policy change.

In summary, both of these studies show a great lack of research influence on program and policy change. This is to a great degree 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 1965 was based to a certain extent on research interpretation and is probable that research provided some background for the other given reasons. It remains, however, that research influence was not of a direct or powerful nature in program development or policy change.

As indicated in the table, twenty-eight new programs were described in The Agricultural Education Magazine.

In essence, it appears that the reasons given for these new programs were of a political nature in eleven cases, of a research nature in two cases, other were general for twenty 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 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 changes which reflected to a large degree the recent shift from education and training designed to prepare beginning farmers and homemakers for citizenship roles to emphasis of education and training for preparing students in the agricultural occupations. The major influences leading to these policy changes were of a political nature. The table reveals the influence of thirty-one instances with research being given as a reason in only nine cases.

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 supposed to its 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 result of agricultural research. It is true that it is a function of the government to see that this knowledge is disseminated. To do this, however, it is necessary to use the educational process in order to do it.

One distinct disadvantage in relying heavily upon legislative authority as the approach is the fact that legislative action is generally reactive (repetitive planning) rather than preventive (future planning). Seldom can legislators be sufficiently motivated to take action legislation designed to provide for the good life until there is very strong, powerful evidence and pressure upon them. Out the ill already in existence.

The 1965 Act was designed more to overcome the shortcoming of our existing vocational programs than it was to provide advanced leadership in directing our educational programs.

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 1965 it was evident that the number of students in the United States, that farmers were becoming more specialised, that agricultural education should change to coincide with changing times. The problem, however, was that legislators could not become enthusiastic about the matter until the symptoms became very advanced. Agricultural educators also must ask themselves where they became enthusiastic about these needed changes.

It was before or after the 1965 Act?

Researchers have a unique opportunity to influence policy which is of concern to agriculture. In the United States, that farmers were becoming more specialised, that agricultural education should change to coincide with changing times. The problem, however, was that legislators could not become enthusiastic about the matter until the symptoms became very advanced. Agricultural educators must ask themselves where they became enthusiastic about these needed changes. Was it before or after the 1965 Act?

A certain preponderance of political influence would be expected to be evident during the current years as the consideration of new legislation is given to the magnitude and intent of the 1963 Vocational Education Act. This act was expressly designed to lead American agriculture to an education system.

With the passage of the Smith-Hughes Act in 1917, vocational education became subject to the influence of federal legislation. Vocational education, however, has not acquired 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 education in the United States can recall some instances of the influence of legislative authority.

Research programs and policies upon agriculture is of political origin. It is the role of the political body to legislate which is legislative in nature. Even as a result of some kind of pressure or influence which has been exerted upon the legislation upon which the research prof. TOWNE is Director, assistant in Education, University of Tennessee. He is also an Associate Professor in the Department of Agricultural Education.

With such a research orientation in the content of agricultural education, it is not if we seek such a dearth of research orientation in the content of agricultural education. The two studies discussed above indicate a great lack of research influence in program development and policy change. Why is it that agricultural education focuses research concerning its function rather than the utilization of such a research influence in program development or policy change? It is because research does not always contribute to the function of program and policy development or policy change. What basis can provide a foundation for program development or policy change? In the reminder of this article four approaches will be considered.

Traditions. Traditions, as a procedure for the functioning of agricultural education in the United States, have been considered as the only possibility of program development or policy change since, by definition, they were the status quo directly disallowing change. If tradition is the sole basis selected, then we must further ask ourselves who is this tradition? Did it yesterday. Perhaps in a static society the use of tradition for program development or policy change is unwise. We were successful yesterday, nothing has changed; therefore, we should do the same thing tomorrow. Tradition then arises as to whether we are living in a static or a dynamic society. The dynamics of 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 federal legislation. Vocational education, however, has not acquired 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 in the United States can recall some instances of the influence of legislative authority.

Researchers who are concerned with research programs and policies, it is to be the role of research to influence the political process. One approach is to influence the available educational opportunities upon national, state, or local educational authorities. This is important as it is the role of political, economic, or social agencies which give direction to educational opportunities.
Implementing Research in Agricultural Education

(Continued from page 197)

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

- Conduct workshops for teachers who are responsible for implementing mental programs in agricultural education in addition to agricultural programs. Conclude one-week vocational guidance institutes for high school counselors. With the help of the Illinois Agricultural Education Association and the University of Illinois, a "Vigilata" was prepared for the whole of the country. If these institutes are to be successful, and we will continue to give them a high school principal's participation. Also, let them be done without the full support and cooperation of these key people in our school systems.

A Role For Research (Continued from page 213)

relevance to program or policy develop-
ment.

Another possible shortening of the research approach may be attributable to the necessity of limiting that which a specific research project can be concerned in. In order to conduct research it is necessary to place restrictions on the populations involved. Perhaps the most important restriction is geographical; the results are difficult to apply in other areas.

A third shortcoming of the research approach is the difficulty of conveying the results to the user. Often this is the result of the researchers in attempting to understand and interpret research reports. It is maintained that a practitioner is a realistic man and cannot be expected to understand the "jargon" of the researcher. This is hard to accept when we recognize the great reliance on research in the conduct of agricultural education. The results of research are considered. Educational research is different from agricultural research that the transition is impossible. If the answer is yes, then it does hold that this is the way it has to be.

Studies Completed in 1966-67

(Continued from page 210)

SEEFELDT, ROBERT A. An Analysis of Factors That Influenced the Selection of Superior FFA Chapters for Entry to the National Chapter Awards. 1966. 40 p. Maryland, College Park.


VANDEN HOUTEN, RICHARD JAMES. Aspects of the Use of Public Relations in Agricultural Education. 1967. 120 p. University of Maryland, College Park.

WOOBDEN, RALPH J. Rodale's Reorganization of the Agricultural Education Magazine. Staff study, 1965. The Ohio State University, Columbus.

JUNE Agricultural Education in Programs Involving Other Vocational Services. Descriptions of occupational education programs that include agricultural education and other vocational education. (Distributive education, home economics, trades and industries, vocational guidance). High school, post-secondary, and adult programs. The total agricultural education in pro-

JULY Agricultural Education in Programs Involving Other Vocational Services. Descriptions of occupational education programs that involve agricultural education and other vocational education. (Distributive education, home economics, trades and industries, vocational guidance). High school, post-secondary, and adult programs. The total agricultural education in pro-

AUGUST Adult Education. New developments in adult and continuing education. Young farmer and adult farmer education. Adult education for farmers in nonfarm agri-
culturally oriented businesses and industries. Instructional materials and teaching techniques for adults. Cooperative adult programs with other vocational services and non-
chological agencies. The preparation of teachers for adult programs. Professional and technical competence.

SEPTEMBER Agricultural Education for Persons with Special Needs. Descriptions of programs involving agricultural education for persons with disabilities, economic, physical and mental handicaps. Programs in depressed rural areas. Programs in urban and city schools. Management 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. Operations of programs. Provision, for local food production, food and nutrition education, North Dakota State University, Fargo.

VAN HOUTEN, RICHARD JAMES. Aspects of the Use of Public Relations in Agricultural Education. 1967. 120 p. University of Maryland, College Park.

WOOBDEN, RALPH J. Rodale's Reorganization of the Agricultural Education Magazine. Staff study, 1965. The Ohio State University, Columbus.

MARCH, 1968

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 committee. 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 August issue must be received no later than May 1, 1968. All photographs (with caption) 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 Warmbold, Editor The Agricultural Education Magazine The Ohio State University 220 Agriculture Administration Building 2120 Fyffe Road Columbus, Ohio 43210

THE AGRICULTURAL EDUCATION MAGAZINE

214

215

THEMATIC FOR VOLUME 41
Stories in Pictures

GILBERT S. GUILER
Ohio State University

Computers play an increasingly important part in research in agricultural education. Ralph J. Wurzel (right) of the Ohio State University and Warner R. Nelson, a graduate student, examine a print-out at the Ohio State University Computer Center.

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

Featuring—
THE IMAGE OF VOCATIONAL EDUCATION IN AGRICULTURE