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AN APPROACH TO TRAINING FOR AGRICULTURAL OCCUPATIONS

*Milo J. Peterson, Head, Department of Agricultural Education
University of Minnesota*

Any attempt to structure an educational program in agriculture to include preparation for farm-based occupations must first provide for the education of farmers. To divert attention and resources from the foundation upon which all agriculture related occupations depend is worse than folly. The establishment of qualified young men and women on economically sound farm business units is basic to training in related occupations because without sound and profitable farm businesses there are no farm-based, related, or agribusiness occupations.

Vocational education in agriculture has three major areas of responsibility. They are (1) vocational preparation, (2) placement, and (3) vocational progress. Training for off-farm agricultural occupations has a logical place in this pattern of functional education.

The Preparatory Responsibility

Vocational instruction in agriculture begins in the high school and continues to exist as the only systematic curricular offering in agriculture that is available at the secondary level in America. Here students should be directed in their learning experiences toward five specific objectives as follows:

1. To develop an understanding and appreciation of modern agriculture and contemporary rural life.
2. To develop leadership and citizenship.
3. To obtain operational and managerial experience in agriculture in order that theory and practice occur together in the learning process.
4. To make a beginning in farming or a related agricultural pursuit in terms of individual aptitude, capacity, interest, and opportunity.
5. To prepare for further study in agri-

culture at the vocational-technical and/or collegiate levels.

The fulfillment of these objectives will require a broadening of the traditional concept of "supervised farming programs." Some modernization of tradition in the Future Farmers of America program may also be in order. In this connection a dean of a midwestern agricultural college has suggested that to better serve our modern integrated agriculture the FFA might well dramatize the broadened scope and responsibility of vocational agriculture by becoming the FLA — Future Leaders of Agriculture!

In considering a transition from "supervised farming" to "supervised agricultural practice" four essentials may be postulated. They are: (1) mastery of principles and practices in mechanized agriculture and farm mechanics, in agronomy and soil science, in animal science, in management and marketing, and in other agricultural disciplines; (2) making the farm or other agricultural business and the home more convenient and pleasant places in which to live and work; (3) financial self-reliance including the ability to manage money and credit wisely through earning, saving, investing, record keeping, and maintaining sound credit; (4) production and marketing of crops, livestock and livestock products or services and commodities utilized in agriculture.

Preparation for entrance into the related occupations must evolve from a degree of education in the science and technology of modern farming. Only after training and experience in the basic occupation of farming will a student have the insight and understanding to "relate" the related occupation to farming in proper perspective. This suggests that specialized study and work

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THE STAFF

HARRY KITTS	GORDON SWANSON
R. PAUL MARVIN	STANLEY NELSON
MILO J. PETERSON, <i>Editor</i>	

experience in the chosen related occupation may be introduced during the junior and/or senior years.

This approach appears to have certain advantages over vocational agriculture programs as presently structured. It provides

an opportunity for the public schools to more effectively serve students interested in all aspects of modern agriculture. It does not discriminate by either place of residence or sex; supervised agricultural practice programs may be appropriately planned for boys and girls whether they reside on farms or elsewhere. It recognizes the interdependence between modern farming and related occupations resulting from the dramatic proliferation in number and kind of purchased inputs utilized in farming today. It provides for occupational mobility in the preparatory stage of vocational education. Finally, it creates, by deliberate planning, a link between high school and post-high school education whether it be at the vocational-technical or collegiate level.

TRENDS IN GRADUATE EDUCATION FOR TEACHERS OF AGRICULTURE

*Glenn Z. Stevens, Professor of Agricultural Education
Pennsylvania State University*

The years just ahead will be marked by a doubling of the present one-half billion dollar annual investment in agricultural research by USDA, State experiment stations and by private industry. Certification standards for teachers will be raised, especially in directions which will stimulate continued in-service professional self-improvement. More vocational agriculture instructors will decide to follow through, from earning the minimum number of graduate course credits for permanent certification, to the successful completion of a master's degree. In doing so, they will make substantial contributions toward at least a doubling of research in education.

In a pamphlet, **You and Research**, a committee of the American Vocational Association while considering the responsibility of the local teacher said, "the teacher has a unique opportunity to aid in research programs because he is at the focal point of the whole education system. All useful investigation starts with a problem arising in actual experience. The teacher is well placed to initiate inquiry for he feels where the shoe pinches . . . in actual practice teachers can do more than ask questions;

they can supply answers, too. Many are now doing research without realizing it. A good teacher is constantly experimenting. When a teacher recognizes a teaching problem and tries to solve it, he is researching in education."

Speaking directly to teachers, the pamphlet continues, "your responsibility is to make known the results of your own 'amateur research.' Volunteer information to the research specialists in your field. Assist in the establishment of pilot programs to test teaching methods and administrative ideas. . . . Become better acquainted with the techniques and methodology of research . . . promptly handle all requests for data . . . cooperate with groups of teachers and with persons doing research in your state department, teacher training institution and state teachers association."

A research-oriented formal program leading to the Master of Science degree is selected by teachers who aspire not only to be able to appraise, interpret and use the published research findings of others, but also to add to the body of basic knowledge in the professional field of agricultural education. The development of skill in re-

search methods and procedures, including modern probability statistics, is essential. The practical advantages of the professional degree of Master of Education are not necessarily lost or even minimized. Improvement of the candidate as an instructor will result from the careful, purposive planning and execution of a worthwhile research study—whether called thesis, paper, or problem—while earning any of the higher degrees.

The steps in scientific method are observed in the design of each research study. **First** is the definition and delimitation of the problem. The process moves from a general awareness of a need, difficulty or question to the specific statement of a problem for which there is reasonable expectation that a solution may be achieved. The **second** phase involves a systematic, critical review of related literature. The investigator must choose or develop a theoretical framework, or construct, which will serve as a basis from which alternative possible solutions may be enumerated. The **third** step is the formulation of hypotheses to be tested, or questions to be answered. These must be as objective as possible and consistent with the accepted theory and purposes of the investigation. It is at this point that the student must make certain that the best criterion measures are selected. That is to say, the outcomes of the study must be such that they can be presented with a high degree of clarity in well planned tables. The statistical procedures to be employed and the level of significance also are chosen in advance. The **fourth** phase is the execution of the study. It should be done with precision and accuracy in the observations which are made. Results worth reporting are most likely to be forthcoming if adequate controls have been incorporated in the design. The **fifth** step is the summarization of the data, the drawing of conclusions and the writing of the report. Judgment must be exercised in refraining from making statements which go beyond the data. Often a study will reveal suggestions for further research.

The preceding paragraph may imply that worthwhile research is experimental. Surely there is urgent need for more investigations in education to use appropriate experimental designs. Annual supplements to the *Sum-*

maries of Studies in Agricultural Education continue to report only a few experiments. There has been, however, a steady advance from simple description to the sampling survey as a research method. The object of an analytical sampling survey is to search for relationships or associations between logically identified factors or causes and observed outcomes, products, processes, situations or conditions. A simple enumerative survey, which is not bound by the requirements of probability sampling theory, may provide useful source data for an analytic survey. Both may aid in the design of an experimental investigation. They can contribute to the specification of independent variables and to the choice of criterion measures.

An analytical sampling survey may be said to be comparative-causal in nature. The method is one of comparison. When effective means have been employed to meet rigorous standards of controls, replication and randomization, probability tests of significance may be made. The results may be reported at a specified level as relationships which may be predicted for the hypothetical population sampled. In order that conclusions drawn may be inferred from the information in the data for the sample groups, errors attributable to biases of selection of observations (cases), to non-response from some, and to accuracy in measurement and estimation must be eliminated or contained within known limits. In other words, use unbiased random sampling from the stratified, or sub-stage classifications. Have not any, or as few as possible, non-responses. Make pilot tests in order to obtain estimates of uncontrolled error and to increase precision of measurement.

Certification in areas of public school administration, including such specialized positions as director of vocational education, of curriculum, or of guidance, now requires more than five years of professional preparation. A certificate as an Educational Specialist is now awarded upon completion of certain newly-established six-year programs. Demand will intensify for doctoral degree men. Serious consideration needs to be given to the selection and encouragement of the most promising young teachers to earn a doctor's degree at an early age.

The proposal for a National Center for Advanced Study and Research in Agricultural Education called attention to the need for systematic post-doctoral work. To the present, leaders in the field have had in-state conferences, seminars and workshops along with regional and national conferences as their only post-doctoral study opportunities. Such meetings invariably are of but a few days duration. The teacher education institution in leading states in each region should contribute both staff and students to summer terms and year-long study sponsored by the National Center and prepare to serve as a host institution.

There is a trend toward greater interdisciplinary cooperation in the social sciences. Graduate education for teachers today includes more course work in psychology, sociology, and economics. Teachers of Agriculture more frequently schedule courses in other fields of education, particularly in administration, guidance, and basic education. Efforts are being made to acquaint teachers with procedures in the other areas of vocational education.

In summary, there are definite trends toward a larger quantity of formal graduate training by more teachers, particularly younger teachers who have recently entered the profession. Concomitantly, the quality of achievement is advancing. Both of these advances are essential if schools are to be successful in adapting to the rapid changes in social and economic phases of American life.

Advanced Degrees in Agricultural Education

The Visitor presents below a list of men receiving advanced degrees since 1956 under the advisership of staff members in Agricultural Education. If any of our readers were left off this list, please let the Visitor know about it so your name may be added.

Degree	Name	Year Received
Ph.D.	Andrews, Dale	1957
Ph.D.	Hudli, Vishwanath J.	1958
Ph.D.	Loreen, Carl O.	1958
Ph.D.	Habito, Celestino P.	1958
Ph.D.	Granger, Lauren B.	1958
Ph.D.	Hanson, Robert A.	1958
Ph.D.	Teske, Philip R.	1958
Ph.D.	Turner, Deane A.	1958
Ph.D.	Henderson, Harry D.	1958
Ph.D.	Youngquist, Bernard	1958

Degree	Name	Year Received
Ph.D.	Hartzog, David H.	1959
Ph.D.	Joos, Loyal W.	1959
Ph.D.	DeBoer, Wendell	1959
Ph.D.	Marvin, R. Paul	1960
Ph.D.	Sahlstrom, Stanley D.	1961
Ph.D.	Nelson, Theodore M.	1961
M.S.	Ivers, Paul H.	1956
M.S.	Roadfeldt, Clarence	1956
M.S.	Reuter, Peter A.	1956
M.S.	Arneson, Leland M.	1956
M.S.	Barduson, Odell T.	1956
M.S.	Davison, Germaine A.	1956
M.S.	Lofgren, Charles E.	1957
M.S.	Hauser, Hervey J.	1957
M.S.	Joos, Loyal W.	1957
M.S.	Marvin, R. Paul	1957
M.S.	Cvancara, Joe C.	1957
M.S.	Broecker, Wayne V.	1957
M.S.	Day, Paul M.	1957
M.S.	Doebbert, Lowell A.	1957
M.S.	Edin, Glen D.	1957
M.S.	Nelson, Stanley W.	1957
M.S.	Ferguson, Gordon E.	1957
M.S.	Morino, Kazutaka	1957
M.S.	Anderson, Douglas	1958
M.S.	Eberhart, Raymond	1958
M.S.	Prasad, Chandrika	1959
M.S.	Klingenberg, Martin	1959
M.A.	Hudli, Vishwanath	1956
M.A.	Hodgkins, Delbert L.	1957
M.A.	Arinaga, Thomas T.	1958
M.A.	Zwiebel, John W.	1958
M.A.	Drechel, William P.	1959
M.A.	Larson, John R.	1959
M.A.	Stegemann, Werner W.	1959
M.A.	Christensen, Virgil	1959
M.A.	Ascheman, Robert E.	1959
M.A.	Brown, Paul W.	1959
M.A.	Brakken, Norman	1959
M.A.	Guelker, William	1959
M.A.	Peirce, Harry, Jr.	1959
M.A.	Schoen, George	1959
M.A.	Schwieger, Delbert	1959
M.A.	Nelson, Melven D.	1960
M.A.	Wright, John E.	1960
M.A.	Novotny, Robert J.	1960
M.A.	Palan, Ralph L.	1960
M.A.	Zarraga, Jose C.	1960
M.A.	Englund, Dewain L.	1960
M.A.	Benson, Lyle F.	1960
M.A.	Eastwood, Gordon R.	1960
M.A.	Moon, Frank A.	1960
M.A.	Sandahl, Arnold G.	1960
M.A.	Shodean, Wallace D.	1960
M.A.	Anderson, Glenn M.	1961
M.A.	Probasco, Peter M.	1961
M.A.	Wall, Raymond C.	1961
M.A.	Hanson, Leslie M.	1961
M.A.	Hogue, Hector M.	1961
M.A.	Schenk, C. Perry	1961
M.A.	Larson, Walter E.	1961
M.A.	Thompson, Fay A.	1961
M.A.	Walker, Donald B.	1961
M.A.	Anderson, Robert W.	1962
M.A.	Aune, Arnt M.	1962
M.A.	Eklund, Wallace D.	1962
M.A.	Kappahn, Keith F.	1962