

## TRENDS IN GRADUATE STUDY FOR TEACHERS

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Decisions relating to increase in the quantity of graduate education for teachers of agriculture are the responsibility of administrators. Action to continue the upgrading of instructors through informal in-service education is a primary function of supervisors. Motivation for superior quality in formal graduate courses and thesis research must be provided by teacher educators.

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.

### Research by Teachers

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 research 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, 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. Judgement 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 Summaries 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-casual 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.

These standards apply to the improvement of teachers of subject matter in the agricultural sciences. For several years the national trend toward emphasis on subject matter in the natural sciences has had an effect on graduate course work of teachers. More credits in technical agriculture and in biological science are being earned by master's degree candidates.

#### Scope and Content of Graduate Programs

Certification in areas of public school administration, including such specialized positions as director of vocational education, or 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 term 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.