

New Approaches to Meeting Needs and Expectations: Looking at the Degree Programs in Agriculture

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We are in the business of educating students, the human capital of agriculture, for an increasingly complex world. We must do the best job possible with limited resources available in meeting the needs of our graduates so they can adequately care for the society we will soon entrust to them.

Calls for Curriculum Revitalization

During the past decade several strong signals have been received which indicate it is appropriate to place special emphasis on curriculum revitalization now.

Several national reports and essays critical of education in general and higher education more specifically received wide exposure.

The 1985 report, *"Integrity in the College Curriculum: A Report to the Academic Community,"* by the American Association of Colleges suggested that college grade inflation which coincided with lower ACT and SAT scores, increased college level remedial programs, and neglected writing skill development, were some factors providing evidence that devaluation of the baccalaureate has occurred.

Other strong signals were cited in a position paper (1983), *"Human Capital Shortages: A Threat to American Agriculture,"* prepared in a project chaired by Ted Hartung, Dean of Agriculture, University of Nebraska - Lincoln. The report sponsored under the auspices of the National Association of State Universities and Land-Grant Colleges in coordination with the American Association of State Colleges of Agriculture and Renewable Resources stated new efforts in the human capital development were vital if the United States was to continue as the lead nation in agriculture.

Another report issued February 1988 by the same two associations, *"Operating Change: Developing Human Capital to Secure American Agriculture,"* called for the establishment of the National Strategic Planning and Coordinating Council for Higher Education of the Food and Agricultural Sciences. In addition, it called for national initiatives in curriculum revitalization to respond to major changes and advances affecting the U.S. food and agricultural system.

National Curriculum Revitalization Efforts

These and other signals have caught the attention of agricultural faculty and administrators who have been and are presently working to address a perceived and real need to revitalize curriculum in colleges of

agriculture across the country. In addition to local institution activity, two major national efforts to encourage curricular change have evolved.

1. Task Force on National Curriculum Assessment.

This project directed by Richard H. Merritt, Rutgers University, focuses on course development related to instruction in agricultural systems analysis, values and ethics in agricultural production, problem solving, public policy development, and leadership. Additional emphasis is being placed on computers in agriculture, energy use in food and agricultural systems, integrated pest management, biological and consumer aspects for humans and their food, internships and cooperative education, cultural and social dimensions of domestic and international agricultural systems, and integrated reproductive management.

2. Curricular Innovation for 2005 — the North Central Curricular Committee Project.

This project began in March 1985 as a North Central Region Curriculum Committee chaired by George Sledge, Associate Dean and Director of Academic Affairs, College of Agricultural and Life Sciences, at the University of Wisconsin-Madison, to organize and conduct a Curriculum Revitalization Project. Support grew with a grant from U.S.D.A. Higher Education Programs, and a plan to stimulate course revitalization through planning processes and curricular models was developed.

In early 1986, 60 faculty members and administrators met at four different locations in the North Central Region to discuss various aspects of curriculum development. Later at the June 1986 North Central Instructional Improvement Symposium held at Iowa State University, 77 faculty members and administrators gave further deliberation to the need for curricular changes, obstacles to change, and the philosophical issues to be addressed.

As a result of these discussions and documentary research conducted, 11 position papers were developed by 18 authors and co-authors and published in *Curricular Innovation for 2005: "Curricular Revitalization — A Necessity,"* George Sledge; *"Concepts and Philosophical Issues in Food and Agriculture Undergraduate Education with Basic Guidelines for Curricular Planners,"* Walter T. Bjoraker; *"Agriculture and Agribusiness — Year 2005,"* William Miller and T.E. Hartung; *"Characteristics Needed of Agricultural College Graduates in 2005,"* David J. Mugler and Lawrence H. Erpelding; *"Obstacles Faced in Achieving Curricular Change,"* Taylor J. Johnston and Richard K. Brandenburg; *"Strategies for Effective Curricular Modification,"*

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Edward E. Darrow and Janet L. Henderson; "Role of Faculty, Administrators, Agribusiness and Alumni in Curricular Change," T. Ross Wilkinson; "Alternative Educational Delivery Systems for the Future — The Rationale and Process," George W. Sledge and Keith Wharton; "International Agricultural Curricular Dimensions for the Future," Karl G. Brandt; "Current Curricular Designs — Strengths and Weaknesses," Kenneth L. Larson and Eric O. Hoiberg; "Futuristic Curricular Models/Designs for the Food and Agricultural Sciences," George W. Sledge, Edward E. Darrow, Earl F. Ellington, Lawrence H. Erpelding, T. E. Hartung, and Kenneth W. Reisch.

The publication was distributed in mid 1987 to land-grant universities nation-wide. In addition, a national meeting, the **National Curriculum Revitalization 2005 Conference**, was held in St. Louis in October 1987 to encourage the nearly 100 participants to deliberate the need and process which could be used to effect curricular revitalization in agriculture on an institutionally specific basis. The conference proceedings were distributed to all land-grant universities in early 1988.

Curriculum Development: Processes and Programs

Allow me to share but a small part of the project and, in that, to attempt to convey some of the excitement and challenges inherent in the process of curriculum change. I will use one of several models described in the last section of the **Curricular Innovation for 2005** publication in an attempt to describe some new approaches to meeting needs and expectations.

The model I will describe is the competency based curriculum development model. The model can be applied to curriculum development in community, technical and four year colleges and universities.

The competency based curricular planning process is built on two assumptions.

1. Curriculum encompasses all activity under the jurisdiction of the university.

2. The planning process should involve all who are affected by the curriculum.

The process begins by considering three distinct areas which have major implications for the end product, the graduate.

1. Institutional Parameters. These items are :a) Mission statements — for the institution of higher education, the college, department, etc., b) Faculty expertise and strengths, c) Classroom facilities, including teaching and laboratory equipment, d) Library and departmental reference resources, e) Industry cooperation, and f) Adequacy of budget.

2. Characteristics that Ag Graduates will Need for Success. At this juncture the curriculum committee may want to define minimum competencies needed by agricultural graduates such as was done by the faculty at the University of Nebraska and was reported by Earl

Ellington at the National Curriculum Revitalization 2005 Conference.

Our challenge is to predict the knowledge base, values, attitudes, and other skills relevant to future success in a wide variety of increasingly complex agricultural careers.

Additional assistance in determining current and future needs of agricultural graduates can be obtained by surveying alumni and employer groups as was done at the University of Kentucky and reported by John Robertson at the National Curriculum Revitalization 2005 Conference.

3. Learner Background. Curriculum designers must take into account the experiences, academic preparation, knowledge, skills, attitudes, and other relevant factors which describe the incoming student. This determines the competencies which need to be taught and the level of instruction to be provided. We might expect that urban students, minorities and non-traditional students may require special attention in curriculum development.

The curriculum committee should prepare carefully for the important task of designing curriculum to prepare graduates for the 21st century. Consultants on-campus or off-campus who have specialized and have perhaps researched curricular planning and development in higher education can provide expert assistance.

Surveys, ad hoc committees, and task forces made up of faculty, students, alumni, employment specialists, and administrators may be utilized to study various issues relevant to curriculum revitalization.

F.H. Buelow, project director of the Curricular Revitalization Project sponsored by the Kellogg Foundation at the University of Wisconsin-Madison, stated that substantial faculty involvement in major curriculum revitalization is vital because faculty hold ultimate responsibility for curricular change. One aspect of this project is curriculum assessment designed to determine curricular needs of students, redesign the curricula, and implement the improvements. To accomplish these goals, ten task forces, each with four to six faculty members and one or more students, were asked to prepare initial recommendations on:

1. A mission statement for undergraduate education in the College
2. Core requirements in the agricultural, biological, and environmental sciences
3. Core requirements in the social sciences and humanities
4. Core requirements in mathematics, statistics, and computer sciences
5. Core requirements in chemistry and physics
6. Core requirements in communication arts and foreign language
7. Agricultural systems in the curricula
8. Options or minors within majors
9. Interdepartmental coordination
10. Agriculture, Technology and Society

The committee needs to relate all relevant factors that impinge on curriculum development to a ways and

means plan. Each characteristic desired in the graduate of the 21st century should be aligned with one or more means to accomplish it. Some goals will be aligned with the academic program consisting of regular classes, laboratories, special problems courses and other credit generating classes. Offerings considered important for each agricultural graduate regardless of major or specialty area will comprise the core curriculum. Clusters of courses and experiences will be identified for majors, specializations, options, and supporting work.

Building a "better" curriculum to prepare graduates for the 21st century requires innovative thinking. Perhaps it is felt that there is not space in the curriculum to add another communications course, a course in logic to bolster problem solving skills, and a course in ethics.

Bonnie Pechtel, director of Project Sunrise at the University of Minnesota, reported leadership skills, problem solving, etc. will be "weaved" into major-specific, discipline-knowledge courses. She theorizes that students will more likely develop these skills by using them in discipline-specific courses than by completing unrelated general education courses teaching the same concepts.

Extracurricular activities including curriculum related student organizations can and do provide valuable benefits in the student's development process and need to be considered part of the educational package.

Internships and curriculum related employment, both off and on campus, provide valuable learning experiences that cannot be duplicated in the classroom, but can contribute immensely to the overall success of the graduate.

Following implementation of the new curriculum, it must be evaluated. Has all of the time and effort paid off in terms of a high quality finished product — the graduate — who is capable of making positive contributions to the industry we serve and our society?

The original curriculum committee or an entirely new curriculum evaluation committee may address the success or failure of the implemented curriculum. The original committee may have a better grasp of the process and the expected results, but the members also have a high degree of ownership of the program and they may tend to be somewhat biased in the evaluation phase. A newly formed evaluation committee may not be familiar with the background, but it might tend to be more objective in evaluating the results of the curricular efforts.

The evaluation should include all those who are affected by the new program — graduates, employers, students, faculty, the consumers of the graduates services, and administrators. In addition, to evaluating results of the revitalized curriculum, the evaluation should determine if changes have taken place in the institutional parameters, characteristics needed by graduates and learner backgrounds.

The evaluation process should lead to changes to improve the level of success of the graduate in work and life. Suggested curricular revisions along with documentation should be presented to the appropriate decision makers, i.e. curriculum committee, faculty meeting, etc.

Curricular evaluation also provides an optimum opportunity to develop marketing strategies. The appropriate bodies may want to use this information to revise recruiting programs and to market the qualities of graduates to prospective employers.

George Sledge, chairman of the North Central Region Project on Curriculum Revitalization shared the following during the last session of the National Curriculum Revitalization 2005 Conference. "During the next two decades, I believe that the higher education institutions serving the food and agricultural sciences will be **confronted with several overarching trends.**" He went on to highlight the trends.

1. There will be greater **interdisciplinary program/course developments** for our academic programs at the undergraduate and graduate levels.
2. Greater attention to **international agricultural awareness, concepts, and development** must be considered in curricular innovations for the future.
3. Emerging, creative **educational delivery systems** must be critically analyzed and utilized in our future academic programs to assure "state-of-the-art" telecommunication techniques in this informational age.
4. **Active modes of learning** for students must be planned.
5. Integrating "**Agriculture, Technology and Society**" into courses, minor fields, or specializations will become increasingly important.
6. Greater attention to the "**Systems Approach**" will be required in the future.
7. **Intra- and inter-state educational programming** will command greater attention in the future.
8. Students — and — their education — are our basic responsibilities.
9. Great attention to **faculty development** as a mechanism to provide innovation in academic programs, to provide retraining, and to provide **supportive renewal** of individuals will occur."

Summary

As we think about curriculum revitalization we must think of more than courses, student organizations, and internships. We must consider the student and the expectations society will have of them. The curriculum revitalization process must allow for adequate involvement by faculty, students, and others affected by the educational program. If we as

educators are interested in the future success of our graduates and the well being of American Agriculture and our society in the 21st century, then we must be open to innovative ideas and programs which are designed to prepare the best possible graduate for the next century.

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Revitalizing Agricultural Curricula

John W. Slocombe and Earl E. Baugher

Follow-up studies of former students are an effective method to assess performance and progress of students in their chosen careers. Such studies are designed to evaluate the product of career programs — the **graduate**. The primary goal of such education, the preparation of individuals for employment, can best be assessed by examining the placement records of graduates. In addition, very important information regarding the strengths and weaknesses of a college degree program may be gathered from former students, as they are in the best position to judge such characteristics (Wentling, 1980).

Projections have been made that United States (U.S.) agricultural output must increase 60 percent by the year 2030. Rapid increases in the sophistication of technology will be necessary in order to achieve this projected increase in agricultural production. Now more than ever, it is imperative that college degree programs remain relevant to the needs of employers. Follow-up studies of graduates provide data which can be used to help improve the on-the-job effectiveness of future graduates. Many researchers have advocated that such studies be conducted on a routine basis with a frequency of at least every five years.

Objectives

The purpose of this article is to present an effective approach for conducting follow-up studies of a

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university degree program and incorporating the results into the curriculum revitalization process. The specific objectives are to:

1. Describe the process used to conduct a follow-up study of the Agricultural Mechanization curriculum at Kansas State University (KSU) using graduates from 1976-1985.
2. Describe the process used to revitalize the Agricultural Mechanization curriculum at KSU based on the data received from graduates.

Process Used for Follow-Up Study

A 32-item survey instrument representing the general and technical education requirements of the Agricultural Mechanization curriculum at KSU was developed by the authors. The instrument employed an 11-point Likert scale to ascertain graduates' perceptions of the agricultural mechanization curriculum. A rating of 11 indicated a course should be added to the subject matter area, a rating of 6 indicated the current number of credit hours in the area should be maintained, and a rating of 1 indicated a course should be dropped from the area. To validate the instrument, it was field tested with six randomly selected agricultural mechanization graduates from other institutions. Refinement was made to the instrument upon completion of the field test. The instrument was further validated by a panel of experts consisting of eight faculty, one administrator, one undergraduate student, and one graduate student in the Department of Agricultural Engineering at KSU. The 32-item in-