

Structuring Research for Agricultural Education: A National Delphi Involving Internal Experts

**Phillp Burlak, University of Illinois
Glen C. Shinn, Clemson University**

Humans are set apart by the ability to solve problems--to do research. Hamlin (1966) described research as "...an unusually stubborn and persisting effort to think straight which involves the gathering and the intelligent use of relevant data" (p. 14). Kerlinger (1986) defined research as a "systematic, controlled, empirical, and critical investigation of natural phenomena guided by theory and hypotheses..." (p. 10). Warmbrod (1986) recommended "...we pay greater attention to the significance and importance of the problems and issues that we research" (p. 9). Is our research guided, thoughtful, and important?

External decision makers tied to agricultural education have the perception that our research lacks focus; that it is soft and not systematic (Buriak and Shinn, 1989). Whether this perception is true or otherwise, the question remains: Do we identify, prioritize and research focused problems and issues that are a part of a collective and systematic effort?

Purposes and Objectives

The purpose of this investigation was to evaluate internally the mission and initiatives identified by Deans and Directors (Buriak and Shinn, 1989), and arrive at a consensus document providing structure for research in agricultural education. This document could be used to 1) communicate initiatives to planners, external decision makers, and the broader research community, and 2) develop an agenda that could fit into the structure of the Planning and Budget Subcommittee of the Experiment Station Committee on Organization and Policy (ESCOP). A second, but equally important purpose was to develop a structure for a research agenda and research reporting in Agricultural Education.

Procedures

Delphi was the method most congruent with the purposes of the study. Selection of internal experts paralleled the method used to select external experts in the initial study by Buriak and Shinn (1989). The top 100 research institutions listed in The Chronicle of Higher Education (1987) that had programs of agricultural education were included in the analysis (N=31).

The Round 1 questionnaire was developed by compiling the consensus responses of the Deans and Directors (Buriak and Shinn, 1989). Round 1 was sent to the Department Head in each of the 31 institutions with instructions to review the document collectively with his/her faculty. The intent of Round 1 was to review the mission statement and the research initiatives identified by the external advisors.

Round 2 was developed from the responses to the Round 1 instrument. Content analysis was used to bring structure to the Round 1 responses. The format for Round 2 was patterned after the classification system for the Current Research Information System

(CRIS) database. Departments were asked to develop open-ended research objectives, fitting them into the described format. Examples were provided to guide formatting. The Round 2 responses were presented to the 1990 NCA-24 committee, (North Central Administrative, Agricultural Education Research Committee) seeking advice on whether to proceed with a third round or attempt to consolidate the Round 2 responses into the structure, again using content analysis techniques. The NCA-24 committee recommended moving directly to the consolidation phase. Consequently, the planned third round was not conducted.

Findings

Mission. Agricultural education refers to the processes of education applied to the body of knowledge generally defined as agriculture. It includes needs assessment, teaching approaches, curricula and program development, instructional and program delivery approaches, application of technologies, program and instructional evaluation, appropriateness of education, history, philosophy, and policy issues related to education in and about agriculture, and institutional organizations in domestic and international settings.

Research in agricultural education should build upon the existing professional knowledge base that includes theoretical, developmental, and applied inquiry. Agricultural education is accountable for teaching, research, and public service activities. To fulfill these responsibilities, the profession must conduct research about learning and teaching; curricula development; delivery methodologies; and assessment of program relevance and effectiveness.

Research Initiatives: The research initiatives were structured similarly to the CRIS format into research problem areas (RPA), research activities (RA), and research objectives (RO) to facilitate communications. The initiatives and structure appear in Table 1.

Table 1. Research Problem Areas, Activities, and Objectives

RPA 1.0	Knowledge Base for Learning and Teaching
RA 1.1	Critical Thinking and Problem Solving
	RO 1.1.1 Metacognition
	RO 1.1.2 Experience
	RO 1.1.3 Sources of Information
	RO 1.1.4 Curricula Structure
	RO 1.1.5 Teaching Techniques
RA 1.2	Individual Achievement
	RO 1.2.1 Motivation, Self-concept, and Individual Difference
	RO 1.2.2 Climate
	RO 1.2.3 Teacher-Learner Interactions
	RO 1.2.4 Quality of Instruction
	RO 1.2.5 Leadership and Organizational Development
RA 1.3	Professional Preparation and Competence
	RO 1.3.1 Prerequisite Experience and Qualifications

Table 1 continued.

		RO 1.3.2	Career Development Theory
		RO 1.3.3	Ethics and Values
		RO 1.3.4	Administration and Organizational Development
RPA 2.0	Curricula and Program Planning		
	RA 2.1 Teaching Basic and Academic Skills		
		RO 2.1.1	Agricultural Literacy
		RO 2.1.2	Integration of Basic and Academic Skills
		RO 2.1.3	Infusion of Science and Mathematics
		RO 2.1.4	Infusion of Communications and Language
		RO 2.1.5	Infusion of Social Values
		RO 2.1.6	Economics, Entrepreneurship, and Free Enterprise
		RO 2.1.7	Guidance and Counseling
	RA 2.2 Needs of Future Agricultural Workforce		
		RO 2.2.1	Demographic Analysis
		RO 2.2.2	Employment, Supply-Demand, and Nature of Workforce
		RO 2.2.3	Job Satisfaction
		RO 2.2.4	Global Market Demands
		RO 2.2.5	Gender, Race, and Diversity
		RO 2.2.6	Specific Training Needs
RPA 3.0	Delivery Methodologies		
	RA 3.1 Educational Methodologies for Learning and Teaching		
		RO 3.1.1	Learning Style - Teaching Style Interactions
		RO 3.1.2	Cooperative Learning and Peer Teaching
		RO 3.1.3	Experiential Methods including Youth Groups
		RO 3.1.4	Methods for Special Populations
		RO 3.1.5	Evaluation Techniques
	RA 3.2 Innovative Instructional Technologies		
		RO 3.2.1	Innovation, Adoption, and Diffusion of Technology
		RO 3.2.2	Expert Systems and Knowledge Representation
		RO 3.2.3	Learner-Client Technology Preference
		RO 3.2.4	Articulation Strategies
RPA 4.0	Program Relevance and Effectiveness		
	RA 4.1 History, Philosophy, Futuring, and Policy		
		RO 4.1.1	Historic Perspectives and Social Change
		RO 4.1.2	Philosophical Bases of Agricultural Education
		RO 4.1.3	Values and Ethics
		RO 4.1.4	Future Roles
		RO 4.1.5	Policy Development
	RA 4.2 Faculty and Staff Development		
		RO 4.2.1	Needs Assessment
		RO 4.2.2	Structures and Organizations
		RO 4.2.3	Undergraduate and Graduate Curricula
		RO 4.2.4	Qualitative Results and Impact
		RO 4.2.5	Perceptions, Satisfaction, and Retention
	RA 4.3 Evaluation of Teaching/Programs		
		RO 4.3.1	Program Impacts

Table 1 continued.

RO 4.3.2	Program Change
RO 4.3.3	Communications Methods
RO 4.3.4	Curricula Designs
RO 4.3.5	Follow-up of Program Completers
RO 4.3.6	Program Evaluation and Accreditation

Conclusions

Deans and Directors concurred that research in agricultural education should build upon the existing professional knowledge base that includes theoretical, developmental, and applied inquiry (Buriak and Shinn, 1989). Internal advisors, i.e., Department Heads and Faculty, reached a consensus on a research mission that concurred with the opinions of Deans and Directors regarding the mission.

There was lack of consensus by the internal experts with the perceptions of the Deans and Directors on the ratings of individual research initiatives. The ratings of initiatives by internal experts were more similar to the ratings found by Stewart, Shinn, and Richardson (1977), and Silva-Guerrero and Sutphin (1990) than to those of Buriak and Shinn (1989). Internal experts did not provide convergence of the initiatives, rather an expansion of initiatives resulted from Round 2. In effect, the additional initiatives made the structure developed by Buriak and Shinn (1989) more like the structure developed by Stewart, et al., and Silva-Guerrero and Sutphin. Speculation regarding these differences due to expansion is beyond the bounds of this investigation.

A principal finding of the Buriak and Shinn (1989) study of Deans and Directors was that research in Agricultural Education lacked focus. This second study conducted internal to the profession confirmed this finding. The researchers conclude that internal experts in Agricultural Education are either reluctant or incapable of focusing research initiatives within a structure (CRIS) compatible to that of other agricultural disciplines. Reasons for the demonstrated inability to focus research can not be determined from the results of this study.

The purpose structure shown in Table 1 is a structured content analysis and condensation done by the researchers of the categories and initiatives forwarded by both internal and external experts. From this structure, the model shown in Figure 1 was developed.

Research initiatives for agricultural education can be grouped into a structure similar to the CRIS database used by ESCOP (See Table 1). The process of structuring and identifying a research agenda can be valuable 1) for maintaining compatibility with the national priorities for the food and agricultural science system and the educational system, 2) for guiding our research investments, and 3) for communicating our priorities to agencies and organizations which have national responsibilities to plan and budget research.



Figure 2. A Structure for a Research Agenda for Agricultural Education

References

- Buriak, P. and Shinn, G. C. (1989). Mission, initiatives, and obstacles to research in agricultural education: a national Delphi using external decision makers. The Journal of Agricultural Education, 30(4),14-23.
- Hamlin, H. M. (1966). What is research? American Vocational Journal. September, 14-166.
- Huff, T. G. (ed), (1990). Research agenda for the 1990s; a strategic plan for the state agricultural experiment stations. College Station, Texas: Texas Agricultural Experiment Station.
- Joint Council on Food and Agricultural Sciences. (1990). Fiscal year 1992 priorities for research, extension, and higher education. Washington, DC: U.S. Department of Agriculture.
- Joint Council on Food and Agricultural Sciences. (1991). Fiscal year 1993 priorities for research, extension, and higher education. Washington, DC: U.S. Department of Agriculture.
- Kerlinger, F. N. (1986). Foundations of behavioral research. Forth Worth: Holt, Rinehart and Winston.

- National Research Council. (1989). Investing in research: a proposal to strengthen the agricultural, food, and environmental system. Washington, DC: National Academy Press.
- Reynolds, M. C. (ed). (1989). Knowledge base for the beginning teacher. Elmsford, NY: Pergamond Press, Inc.
- Silva-Guerrero, L and Sutphin, H. D. (1990). Priorities for research in agricultural education. The Journal of Agricultural Education. 31(3), 1-13.
- Stewart, B. R., Shinn, G. C. and Richardson, W. B. (1977). Concerns of the agricultural education profession: Implications for teacher education. The Journal of the American Association of Teacher Educators in Agriculture. 17(3), 19-26.
- Warmbrod, J. R. (1986). Priorities for continuing progress in research in agricultural education. A paper presented at the 35th Annual Southern Region Research Conference in Agricultural Education. March. North Little Rock, AR.
- Wilson, K and Morren, G.E.B. (1990). Systems approaches for improvements of agriculture and resource management. New York: McMillian Publishing Co.