

## FOCUSING AGRICULTURAL EDUCATION RESEARCH: STRATEGIES FOR THE DISCIPLINE

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The community of scholarship between agriculture and education is agricultural education. The agricultural education discipline contributes to agricultural and educational systems by linking the technical areas of agriculture and the humanistic dimensions (Barrick, 1988). It is hard to appraise the impact of the discipline called agricultural education. It is also difficult to see the future potential of agricultural education.

It is great when students and visitors from other countries ask questions about the success of agricultural education in the United States. Likewise, it is rewarding when people from other disciplines ask for agricultural education expertise with a new initiative. These people see the contributions that agricultural education has made and/or can make in agricultural and educational development. The 1985 approval of an "Advisory Committee" for agricultural education research by the North Central Regional Association of State Agricultural Experiment Station Directors expanded the acceptance of agricultural education as a discipline (NCA-24 Committee, 1987).

This discussion is on focusing agricultural education research. I have three objectives: 1) to analyze the dimensions of agricultural education, 2) to summarize critiques of agricultural education research, and 3) to suggest strategies for focusing agricultural education research. To accomplish these objectives, I will be building on the work of others in the discipline.

### The Dimensions of Agricultural Education

Discipline: Barrick (1988), in The Discipline Called Agricultural Education, described the unique mission of agricultural education. He defined agricultural education as "the scientific study of the principles and methods of teaching and learning as they pertain to agriculture" (p. 5). Barrick (1988) made the following observations about the discipline of agricultural education and its evolution:

- \*Agricultural education is rooted in agriculture and education
- \*Agriculture grew out of the biological sciences
- \*Education applies psychological and sociological theories

Processes: The NCA-24 Committee (1987) defined agricultural education as "the processes of education applied to the body of knowledge generally defined as agriculture." The Committee further stated that agricultural education includes such subjects as: needs assessment, formal and informal teaching approaches, curriculum and program development, instructional and program delivery approaches, application of educational technology, program and instructional evaluation, appropriateness of education, policy issues related to education in agriculture, institutional organization, and management of agricultural institutions in domestic and international settings (NCA-24 Committee).

Buriak and Shinn (1989a) grouped all agricultural education research activities into four research problem areas and described them as:

- \*Knowledge Base for Learning and Teaching--"addresses the theoretical-conceptual framework for learning and teaching" (p.1)...
- \*Curriculum/Program Planning--"addresses curriculum and its relationship to presage, context, process, and product variables (p. 7).
- \*Delivery Methodologies--"concerned with the linkages between the sender and receive, and the techniques and technologies facilitating these linkages" (p. 11)...
- \*Program Relevance and Effectiveness--"addresses the match between intent and outcome while measuring the validity and reliability of the process, as well as the knowledge, values, and skills of the teacher/agent and client" (p. 15).

Thus, the processes used in agricultural education to apply teaching and learning as they pertain to agriculture can be generally named: 1) curriculum planning, 2) delivery methodologies, and 3) program evaluation.

Settings: Barrick (1988) advocated that the "methods and principles of teaching and learning are the same; only the application settings differ" (pp. 7-8). The NCA-24 Committee (1987, p. 3) identified the following settings for agricultural education: 1) Formal programs offered by K-12 schools, postsecondary schools, and colleges/universities; 2) Informal programs offered by extension services, other agencies, and organizations; 3) Educational short courses, individual consultations, written and audiovisual materials created and presented by both public and private businesses and agencies, and agricultural programs provided by television, radio, newspapers, magazines, and computer services.

We must fully understand the dimensions of agricultural education (Figure 1) before we can successfully focus our research. The domestic and international settings for agricultural education can be depicted as an arch. The keystone of the arch is the university, where most agricultural education research is designed and directed. Other application settings for agricultural education include schools, extension, industry, and agencies. (Perhaps there are other settings; e.g., military, space, correctional institutions). The arch rests on two vital bases—the processes of agricultural education (curriculum planning, delivery methodologies, and program evaluation) and the discipline of agricultural education (teaching and learning as they pertain to agriculture). Agriculture and education form the foundation for agricultural education with footings of biological and physical sciences, psychology, and sociology.

#### Critiques of Agricultural Education Research

We all appreciate sharply focused photographs. The same is true with research. If agricultural education research is not focused, the discipline will also lack focus. A discipline will be no stronger than its means for verifying existing knowledge and creating new knowledge and the dissemination and application of that knowledge. Research must be the strongest component of a discipline, serving as a foundation for teaching and extension.

Most university agricultural education units in the USA resulted from the Smith-Hughes Act of 1917, for the purpose of teaching training. This narrow focus has created some problems for the development of agricultural education as a discipline. The NCA-24 Committee (1987) advocated that the role of university agricultural education programs should include "research activities to add to the body of literature on processes of education applied to agriculture" (p. 3).

Agricultural education can take pride in several research accomplishments. The Journal of Agricultural Education has matured as a research publication. Regional research meetings and the annual national agricultural education research meetings have become effective forums for reporting research. A review of the agricultural education research reported and published reveals significant improvements in research methodology. However, we can not say the same about the focus of agricultural education research. McCracken (1982) stated that "agricultural education is a profession in which...research has not been well coordinated" (p. 33). In this regard, Warmbrod (1986) advocated that:

...progress during the past years in the technological and methodological aspects of research has not been accompanied by comparable improvements in another very important aspect of research; namely, the relevance, significance and importance of problems and issues that we investigate (Warmbrod, 1986, p. 9).

Authors (Warmbrod and Phipps, 1966; Carpenter and Rogers, 1970; Newcomb, 1978; Lee, 1985) of the reviews and syntheses of research in agricultural education have also filed a "lack of focus" indictment against agricultural education research. Specific weaknesses that they identified included: mostly descriptive, limited to identification of desirable practices, limited disseminations and implementation of findings, piecemeal, rarely cumulative, lacks a sound theoretical framework, mostly conducted by graduate students, lacks depth.

Many of these weaknesses stem from lack of research focus. Buriak and Shinn (1989b) reinforced this indictment when they found that 100% of the directors of experiment stations, 78% of the directors of resident instruction, and 64% of the deans of education believe that research in agricultural education lacks focus. Researchers in agricultural education must take the initiative to prioritize needs and direct resources to high-impact research.

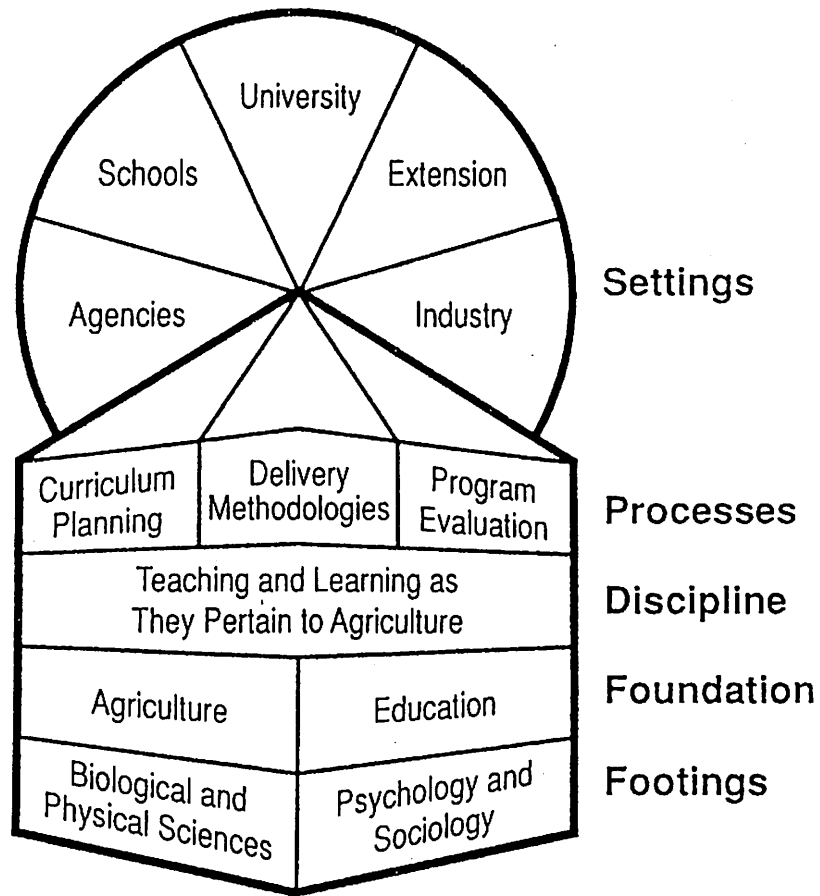


Figure 1

### Strategies for Focusing Agricultural Education Research

The term "strategy" is a strong term. It refers to combining and employing means on a broad scale for gaining advantage in war. Perhaps this term is appropriate, considering that agricultural education is (as are some other disciplines) experiencing some self-defeating tactics. One self-defeating tactic is the substance of our research and is commonly referred to as "lack of focus." Because a discipline is commonly viewed through its research, we can understand why some say that the discipline of agricultural education lacks focus.

Considering the points made earlier in this discussion, I believe the following strategies for focusing agricultural education research are worthy of consideration.

**1. Compare national agricultural goals with dimensions of agricultural education.**

The Joint Council on Food and Agricultural Sciences has identified the following 12 priorities (listed in rank order) for agriculture for FY 1991 (Joint Council on Food and Agricultural Sciences, 1989):

- a) improve water quality and quantity
- b) expand biotechnology and its application
- c) develop agricultural production systems compatible with the environment
- d) nurture the nation's talent base in the food and agricultural sciences
- e) improve understanding of diet, human nutrition, and health relationships
- f) enhance competitiveness of U.S. agriculture
- g) genetically improve economically important plants
- h) improve safety and quality of food products
- i) investigate potential effects of global climate changes on agriculture and forest productivity
- j) enhance control of agricultural and forest pests and diseases
- k) develop new and expanded uses for agricultural and forest products
- l) enhance rural economic development

Agricultural education research can help with several or all of these priorities. Several questions can be asked to help focus agricultural education research on these priorities: Can agricultural education make the best contribution at this time through curriculum planning, delivery methodologies, or program evaluation? Which application setting should be targeted—university, schools, extension, industry, or agencies? Matrices can be constructed to compare agricultural priorities with agricultural education processes and application settings, providing useful tools for focusing research.

**2. Match agricultural education research with agricultural centers of excellence.**

Agricultural centers of excellence are yielding new technologies, and agricultural education can assist with technology transfer activities by being a part of interdisciplinary research teams. Examples of agricultural centers of excellence emerging on university campuses where agricultural education may make a contribution include:

- a) sustainable agriculture
- b) water resources
- c) food quality and safety
- d) meat exports
- e) rural development
- f) agricultural products processing
- g) biotechnology
- h) economic development
- i) soil tilth
- j) integrated pest management, and
- k) aquaculture.

**3. Form partnerships with agencies and industry.**

Identification of objectives that agricultural education has in common with industry and/or agencies can expand resources and help focus research. Partnerships can also facilitate dissemination and implementations of research findings. Partnerships with state and federal education agencies have served agricultural education research well in the past, but we should be more aggressive in forming partnerships with such agencies as the United States Department of Agriculture, the United States Soil Conservation Service, state departments of natural resources, the Farm Bureau, and state and national commodity organizations. Opportunities for forming partnerships with private corporations and organizations to achieve mutual goals should also be explored.

**4. Tie agricultural education research to educational centers of excellence.**  
Agricultural education can support and extend the work of educational centers of excellence through the application of teaching and learning to agriculture. Examples of education centers where agricultural education may receive support or make a contribution include:

- a) instructional technology
- b) special education
- c) science education
- d) curriculum
- e) environmental education

**5. Develop in-depth theoretical framework for agricultural education research.**  
The literature cited in agricultural education research is frequently limited to other agricultural education research. Our research should be carefully tied to the applied sciences of agriculture and education and be rooted in the theories of biology, physics, psychology, and/or sociology.

**6. Plan research programs to develop centers of excellence in agricultural education.**  
Research initiatives that focus on problems and issues in agricultural education in a programmatic and sustained manner are needed for cumulative impact.

**7. Include field testing and application components in research initiatives.**  
The discovery of new knowledge will not necessarily improve a discipline. Means for systematic delivery and application of the new knowledge are equally important. Model agricultural education programs that feature the new knowledge can facilitate use of research findings.

**8. Form teams of scientists for agricultural education research initiatives.**  
Programmatic research initiatives (even ones that are well focused) demand resources and expertise beyond those that can be provided by a sole researcher. Effective research teams of the future will include scientists from outside agricultural education, technicians and graduate students inside and outside the discipline, and will frequently cross state and national boundaries. Multidisciplinary approaches will be needed to solve many of the research problem areas identified.

**9. Develop international memorandums of agreement for research.**  
Memorandums of agreement provide a means for collaborative research on international problems and issues and, at the same time, help to internationalize our teaching and extension functions.

**10. Select faculty on the basis of programmatic research needs.**  
The research priorities of a university agricultural education department should be identified and used as a basis for selecting new faculty. Persons filling the positions would be expected to develop a research program in the focused area accompanied by teaching and extension activities.

**11. Judge research on its impact.**  
Research is frequently judged by assessing the process (procedures and methodology employed). As a discipline matures, it should have enough confidence in its research methodology to evaluate research on its educational, social, environmental, agricultural, and/or other impact.

**12. Rewrite the job description of some university agricultural education professors to include a significant research responsibility.**  
Research is commonly an "add on" to teaching and extension duties of many agricultural education faculty. It is time to make research the primary duty of some faculty.

**13. Develop a national, regional, and state research agenda for agricultural education.**  
The work by Buriak and Shinn (1989a) to develop a national research agenda is very important to the discipline of agricultural education. This should be followed by the development of research agendas at the regional level. Regional agricultural experiment station committees (such as NCA-24) can provide this leadership at the regional level. National and regional priorities should be used in focusing state research initiatives on problems of substance.

**14. Analyze national, regional, and state studies and plans to identify research priorities.**  
Understanding Agriculture: New Directions for Education (National Academy Press, 1988) and Strategic Plan for Agricultural Education (National Council for Vocational and Technical Education in Agriculture, 1989) establish national priorities for agricultural education that can be useful in

focusing research. State departments of education and state extension services also produce planning documents that can be used in setting research priorities.

#### Summary

Agricultural education has a critical role to play in the transfer of agricultural technology. For the discipline to realize its full potential, research is needed to light the way. Research adds to the existing knowledge base, helps us critically examine our current practices, and trains graduate students as the new generation of scientists. Our challenge is to develop research programs with high impact. This will require teams of researchers pursuing relevant problems in a sustained manner that yields clear solutions and, when applied, provides vigor for the discipline of agricultural education.

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