

**DEFINING THE KNOWLEDGE BASE OF OUR PROFESSION: A LOOK AT
AGRICULTURAL AND EXTENSION EDUCATION IN THE 21ST CENTURY**

A Thesis

by

GREGORY AARON CUMMINGS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2005

Major Subject: Agricultural Education

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May 2005

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ABSTRACT

Defining the Knowledge Base of Our Profession: A Look at Agricultural and Extension
Education in the 21st Century. (May 2005)

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The profession of agricultural and extension education has increased in complexity in response to the demands of the changing field of agriculture and the need for educators who are responsive to those demands. A standardization of the knowledge base of the profession is seen as necessary in light of geographic mobility, the nationwide emphasis on assessment, and the need for a public relations tool that clearly articulates the concepts forming the framework of agricultural and extension education.

In this study a panel of experts consisting of agricultural and extension education leaders nationwide, responded to open-ended and Likert-type surveys online as part of a Delphi technique to establish the knowledge base for agricultural and extension education. Three rounds of the Delphi technique were used. A minimum of 13 of the 24 panel members were required to respond to each round. Ninety-five statements were initially generated by 16 panel members in response to an open-ended statement in Round I which asked the participants “What are the articulated understandings, skills, and judgments that serve as the foundation of knowledge (“the body”) for professionals in agricultural and extension education?” These statements were presented to the panel

members in Round II. Two-thirds of the panelists had to “Strongly Agree” or “Agree” with each item for it to be retained for Round III. Based on the responses of 14 panelists in Round II, 67 items were retained for Round III, and one item was added based on panel input. After Round III, three items were eliminated due to lack of two-thirds achievement of “Strongly Agree” and “Agree” ratings by 17 respondents. Thus, 65 statements established the knowledge base of agricultural and extension education in this study. Among the knowledge base are concepts related to traits of effective educators; management issues; environmental impacts on instruction; curriculum development; learner-based contextual, applied pedagogical strategies; leadership development; communications; assessment strategies; community and collegial connections; integration of technology; critical thinking and problem solving; and teaching as a changing process grounded in sound theory.

DEDICATION

To my loving mother, Merrilyn Beth Niederwerfer Cummings, who has supported me through all of my educational pursuits. I want to thank you for all of your encouragement and support over the years. Without you none of this would have been possible. You have served as my role model and mentor. I love you more than you will ever know. Thank you!

This work is also dedicated to my wife, Debrah Luchia McClain Cummings. Thank you for taking care of the children on all of the late nights. You are a great source of inspiration and encouragement. Thank you most of all for being my best friend.

I would also like to dedicate this work to the encouragement of my children, Tanner Mac Cummings and Allie Kay Cummings. You are only limited by what you limit yourself to achieve. I wish both of you well in your educational endeavors. You are both brilliant children, and I know that you are capable of achieving more than I have ever hoped for the both of you. Reach for the stars! Love Daddy.

I would also like to dedicate this study to my late grandfather Frank Niederwerfer. You were the guiding light in my childhood that helped me understand the importance of agriculture and our natural resources. You never waived in your belief that our future generation was our only source of hope. It is because of you that I am involved in both agriculture and the education of tomorrow's future. I thank God each and every day for the direction that you gave to me during my early years. The Idlenot tradition carries on! Thank you!

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CHAPTER I

INTRODUCTION

The agricultural and extension education profession is in a state of continual change and finds itself challenged with meeting the needs of the modern agricultural industry. Wingenbach and Cummings (2002) noted that the historical roots of agricultural and extension educations are based in teaching and learning processes as evidenced through traditional programs that prepare agriculture teachers and extension agents nationwide. Traditionally, post secondary programs of agricultural and extension education have focused their financial and human resources on preparing undergraduate and graduate students for careers in secondary education settings and in community-based extension programs.

These two programmatic foci have funneled students majoring in agricultural and extension education into one of two career paths. Students would choose to enter the formal education field known today as agricultural science education, in which students were employed as high school teachers of agriculture, or extension education, in which students entered careers in agricultural and extension education in more informal settings as community educators with the nation's cooperative extension system. These two career paths are traditional to most post-secondary agricultural and extension education programs and continue to play very important roles. While these primary foci have remained, the profession of agricultural and extension education has evolved, and

This thesis follows the style and format of the *Journal of Agricultural Education*.

thus the spectrum of this profession has shown tremendous growth into newer domains within the fields of agriculture and education.

Undergraduate students choosing a career path in agricultural science education focus their course work in scientific agriculture and in education. The primary focus of their educational course of study is in pedagogical processes and curriculum development. The central focus for students pursuing a career in extension education is also in scientific agriculture and educational course work supplemented by a study of both pedagogical and andragogical processes. The extension agent's role as an educator is traditionally centered on the teaching of both adults and children in less formal settings than that of the high school agricultural science teacher.

Wingenbach and Cummings (2002) have pointed out that early agricultural and extension education encompassed what we have come to know today as knowledge bases (specific agricultural concepts), which a person must know in order to compete successfully as an educator in a comprehensive agriculture program. Wingenbach and Cummings (2002) have stated that a knowledge base is the content of a particular domain or field of knowledge. Each profession and academic program has a unique field of knowledge upon which its profession and area of study is based. This is the knowledge area in which the faculty and/or experts of a profession collectively proclaim to be experts. The knowledge base of agricultural and extension education provides the domain of scientific knowledge that we teach, base our research on, and disseminate to the public. A knowledge base is analogous to the foundation of a house. It is the

knowledge upon which the profession is rooted or built. It is the foundation for the profession, as well as for the professional organizations of that profession.

Re-defined by faculty at Texas A&M University (2002), agricultural and extension education is a discipline working at the interface of human performance systems, food systems, natural resource systems, and environmental stewardship. According to Wingenbach and Cummings (2002), as technological advances bring teaching and learning audiences closer, a more global perspective is crucial to the future success of world-class programs in agricultural and extension education. As the profession of agricultural and extension education forms and shapes itself around the agricultural industry, it finds itself changing faster than ever before.

Today, post-secondary departments of agricultural and extension education nationwide have become more complex, catering to the needs of the agricultural industry and to the career options of their students. The profession of agricultural and extension education has changed over the last century to meet the needs of a changing agricultural industry. Departments have aligned curriculum with the onset of the global agricultural industry, the need for leadership in agriculture, advances in technology, new methods in global and domestic business, and agricultural careers involving a high level of scientific knowledge. Agricultural and extension education departments across the United States have made pragmatic adjustments in courses and degree pathways offered. Conroy (1999) pointed out that agricultural and extension education has evolved into a hybrid model of vocational-technical-applied science and mathematics education with a relationship to mainstream vocational-technical education as ill-defined as the one it has

with the academic disciplines. The challenge for the future is to blend the sciences, math, and vocational aspects of agricultural education to produce professionals who can integrate these core areas with the applied focus of vocational education while filling the employment demands in agricultural education.

Over the last 50 years, we have seen the agricultural industry in the United States shift from primarily an agricultural production economy to a highly scientific, business, and research-based agricultural economy. (Duffy, 1998) While today's agricultural industry in the United States continues to be primarily a production-based industry, there has been a great need for scientific and technology-based agricultural pursuits to back an increasingly shrinking number of agriculturists involved in the actual production of food and fiber. (Michigan Farm Bureau, 2001) The growing service sector of the agricultural economy has shifted the focus of agricultural and extension education programs across the country. The demand has been for educators who can make this shrinking production population in the modern agricultural arena more efficient and productive through the implementation of relevant scientific, technological, and business applications. (International Food Information Council, 2005)

The United States has seen phenomena unlike any other industrialized nation. While the number of production agriculturists and production agricultural operations has decreased in the United States, there has been a rise in agricultural yields. In 1935 there were 6.5 million farms in the United States. The average farmer at that time produced enough food to feed 20 people. By 2002 the number of farms had decreased to 2.16 million and the average U.S. farmer was able to produce enough food each year to feed

more than 100 people. Today's production agriculturists continue to see low commodity prices due to a continued surplus of agricultural commodities. They also seek new and innovative ways to produce and market their agricultural products. Present day consumers in the United States have the luxury of the lowest food and agricultural product prices, while having the best selection of agricultural products available in the world. Breaking scientific and technological advances must be effectively disseminated to producers to continue this trend. (International Food Information Council, 2005)

As the agricultural industry has changed, so has the role of agricultural and extension education departments. The profession has had to seek new and innovative ways to educate, disseminate information, train future professionals, and cater to the current demands of modern agriculture. Today, we find very traditional programs similar to those upon which the profession was founded and new programs that have emerged to meet the needs and demands of today's complex agricultural industry. Many larger departments have opened programs that cater to students who seek expertise in international agricultural and extension education, technical skills in educational delivery systems, leadership skills, communication strategies, and modern research techniques.

The change in the profession of agricultural and extension education has challenged professionals to ask the following questions: What is the knowledge base upon which today's profession of agricultural and extension education rests? What core knowledge areas compose today's post-secondary agricultural and extension education programs? What are the areas of knowledge that have stayed with the profession from

the beginning, and what knowledge bases have evolved to meet the needs of the increasingly advanced agricultural industry? In their research Wingenbach and Cummings (2002) built on these ideas and asked the following questions as well: As agricultural and extension education programs change to meet stakeholders' present and future needs, what types of knowledge and/or practical applications of that knowledge provide the basis of our discipline? Who decides what types of knowledge and/or applications of that knowledge are important for the entire discipline?

Problem Statement

Limited research, even by the larger agricultural and extension education departments across the nation, has been conducted to identify the core knowledge bases in agricultural and extension education. Most modern professions and organizations have gone to great lengths to identify the unique knowledge upon which their profession is based. Agricultural and extension education has lagged behind other professions in this area.

This research project focused on bringing forth the knowledge bases that experts saw as defining the profession of agricultural and extension education across the United States today. It examined both the knowledge bases brought forth at the beginning of the profession and the knowledge base of modern agricultural and extension education. As the profession continues to mature and evolve to meet the needs of our stakeholders, we know that our knowledge base will continue to change. This research project sought to identify knowledge bases which reflect both the traditional bases of the profession which need to be retained and the bases which society is demanding be included for the

development of the most marketable professional agricultural educator in the 21st Century.

Objectives

The objectives of this research project were to:

1. Determine current core knowledge areas fundamental to the profession of agricultural and extension education across the United States.
2. Assess the level of importance of each current core knowledge area to the profession of agricultural and extension education.

Research Questions

The following research questions were addressed in this study:

1. What are the core knowledge areas identified by experts in agricultural and extension education in the United States that compose the common knowledge base of the profession?
2. How do the core knowledge areas identified by experts rank in terms of order of importance to the knowledge base of the profession of agricultural and extension education?

Definition of Terms

Certain terms were defined for use in this study:

Agricultural extension education course of study: Courses taken by agricultural and extension education majors in preparation for employment through the Cooperative Extension Service as county extension agents.

Agricultural and extension education profession: Post secondary agricultural and extension education programs as they exist within the continental United States, inclusive of all teaching, research, and extension programs therein.

Agricultural science education course of study: Courses taken by agricultural and extension education majors in preparation for their initial secondary teaching licensure or certification and teaching in secondary schools.

Consensus: A level of agreement in which at least two-thirds of a group rated a knowledge base statement with a 5 or 6 on a 1-6 rating scale.

Contextual application: The use of an idea in a particular setting. Context facilitates or constrains the educator's efforts through 1) its mission, philosophy, functions, structures, and processes, 2) its available resources and the means by which those resources are allocated, and 3) its historical relationships to other organizations (Boone, 1985).

Delphi technique: "Method for the systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses" (Hect, 1979, p. 206).

Knowledge area: A specific piece of knowledge that when put with other pieces of knowledge compose the knowledge base of a particular profession.

Knowledge base: "The content of a particular domain or field of knowledge. Knowledge expressed in articulated understandings, skills, and judgments which are professional in character and which distinguish more productive [faculty members] from less productive ones" (Reynolds, 1989, p. ix). "This body of knowledge is under girded by theory,

research, and a set of professional values and ethics” (Corrigan & Haberman, 1990, p. 195).

Limitations of the Study

The following assumptions and limitations of this study were noted:

1. The study was limited by 24 selected professional experts in agricultural and extension education across the United States.
2. The study was limited to data collected between February and June 2004.
3. The study was limited by faculty who held rank in agricultural and extension education and who currently or had previously held advanced leadership positions (e.g. dean, associate dean, assistant dean, director) in agricultural colleges in the United States.
4. The results of this study may not be generalized to a larger population.
5. The respondents were those individuals who felt comfortable using the Internet as a response mode for research.
6. It cannot be guaranteed that the same respondents participated in each round of this study.

Assumptions of the Study

The selected expert panel members were experts in the field of agricultural and extension education who held faculty rank in a department of agricultural and extension education at a four-year university. The panel members also held or previously had held an advanced leadership positions in colleges of agriculture. The selected expert panel identified the knowledge base of the profession for agricultural and extension education.

There were three rounds of survey questions to which the panel of experts responded. The first round consisted of an open-ended question. The panel members read each statement in latter rounds and rated each statement appropriately. It is assumed that panel members did not discuss any aspect of the research among themselves. It is assumed that the respondents took the time needed to thoroughly read the directions and formulate their answers. It is assumed also that the respondents were familiar with the use of the Internet as a means of responding to the questions.

Significance of the Study

As a profession, it is extremely important to identify the knowledge base that identifies the profession as a whole. Several agricultural and extension education departments have tried to identify the base of knowledge that forms their foundation. To date there has not been a research study that attempted to identify a common core knowledge base upon which the agricultural and extension education profession across the United States is based.

As a continually growing and transforming profession, there exists a need to continually evaluate and analyze what makes up the collective foundation of agricultural and extension education. While niches exist in differing geographic locations and departments of agricultural and extension education across the United States, and each department will vary in the specific degrees offered, research conducted, and extension program foci, there is a collective body of knowledge shared by the entire profession. However, this body of knowledge has never been clearly defined.

The results of this research study will help the profession collectively identify the core knowledge areas associated with agricultural and extension education nationwide. By identifying the knowledge base of the profession beyond departmental levels, a clearer picture of the role of agricultural and extension education will become more apparent. As the knowledge base of the profession presents itself and the importance of it is presented, we can then, as a profession, better prepare for current and future requirements of the agricultural industry. A defined knowledge base is also an effective public relations tool. It clearly articulates to others what the profession of agricultural and extension education is all about. The knowledge base provides a means of communicating with other areas of education, community leaders, legislators, and business and industry personnel regarding the essence of the profession. As professionals move from one geographical location to another in the United States, a common knowledge base facilitates job and educational transitions. Decision making regarding programs and resources at the local, state, and national levels is easier when a common base of knowledge is used.

Summary

The changes in agricultural industry have a direct relationship to changes that have occurred and continue to occur in the profession of agricultural and extension education. It is very important for this profession to identify the knowledge base on which it currently places its foothold. In identifying the current knowledge base, the profession will be able to better identify its present role in the educational arena, and it will be better equipped to identify the future importance of the profession. Every

profession should have a current understanding of its knowledge base as a tool for articulating its mission to others. The knowledge base becomes the foundation for the evaluation and establishment of future knowledge areas deemed important for inclusion.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Barrick (1989) noted that the discipline of agricultural and extension education has roots deep in the history of education and agriculture in the United States. Agricultural and extension education is a profession with a unique position at the cross roads of social sciences, agriculture as a science, and education. Agricultural and extension education as a profession is relatively young. Barrick (1989) stated that those who have been involved in agriculture throughout their lives often have difficulty with the realization that agricultural science, a science that could and should be studied, did not exist prior to the 19th century.

Historical Overview

Barrick (1989) stated the Morrill Acts of 1862 and 1890 contributed greatly to the development of this profession of agriculture. He noted that “When the realization that higher education could serve the common person interested in the agricultural and mechanical arts, there came a system of public institutions of higher education called the land-grant colleges” (Barrick, 1989, p. 1). Barrick (1989) also noted that not only did the Morrill Acts provide access to higher education for more people, the fact also was established that a body of knowledge called agriculture existed and was refined to a point sufficient to warrant study at the baccalaureate level. These acts and subsequent legislation provided for an agricultural experiment station to be established in each state

and for a system of delivery of agricultural knowledge to the masses or common people through an extension of the college at each land grant university.

Stevens (1967) pointed out that a community of scholarship existed between the natural science of agriculture and the behavioral science of education. Both agriculture and education are applied sciences. Stevens stated “The evidence of their value is their record of rewarding application” (Stevens, 1967, p. 5). Moore (1988) pointed out that pioneers such as Rufus Stimson established the marriage between agriculture and teaching. Barrick (1989) pointed out that Bricker emphasized the need for educators in agriculture and proposed agricultural and extension education departments as early as 1914.

From the inception of the profession, agricultural and extension education programs have experienced a magnitude of change. Today, professionals in agricultural and extension education are able to examine philosophically and structurally the growth and development of the profession. Wingenbach and Cummings (2002) noted that the historical roots of current agricultural and extension education programs are based on teaching and learning processes in traditional agriculture teacher and extension agent preparation tracks.

Researchers Hamlin (1949) and Phipps (1972) provided a foundation for a philosophical base in agricultural and extension education. Hamlin’s community school concepts (knowledge bases) included program objectives and evaluation, program planning, advisory councils and committees (used for community needs assessment), relationships between school and community (agricultural communications), and

procedures for teaching agricultural and extension education. Phipps' recommendations for concepts to be covered in a comprehensive agricultural and extension education program included occupational orientation and exploration, citizenship, consumer education, applied science, and practical arts. These two researchers laid the foundation for the idea of knowledge bases, which the profession needs to update and articulate clearly today.

While teacher and extension education continues to be a primary focus of the profession, there is a plethora of new and expanded foci in agricultural and extension education. The faculty at Texas A&M University (2002) proposed that a modern definition of the agricultural and extension education profession is that of a world-class system functioning at the crossroads of human performance, food systems, natural resource, and environmental stewardship. Wingenbach and Cummings (2002) suggested that as advances in technology reduce the gap between teachers and learners, a more global perspective is crucial to the future successes of world-class agricultural and extension education extension programs.

According to Wingenbach and Cummings (2002), agricultural and extension education programs in the United States have experienced two primary paradigm shifts in the last 50 years: a shift from vocational or community-based instruction to more individualized educational programs and a shift from production to agricultural science-based curricula. Early agricultural and extension education programs focused on a set of skills and knowledge needed by an individual to successfully participate in a production agricultural career. Wingenbach and Cummings (2002) noted that programmatic

changes, from production to science, have opened doors to many new agricultural careers. New knowledge, skills, and attitudes are needed to participate in today's agricultural arena. Some of these include better communication skills, business skills, technical skills, and leadership skills.

Knowledge Bases of a Profession

Each profession has a foundation of knowledge upon which it is based. This knowledge base is what makes a profession unique and distinguishable from other professions. Corrigan and Haberman (1990) described four essential elements of a profession that serve as the framework for its analysis. These four critical elements include a knowledge base, quality controls, resources, and conditions of practice. In examining the framework of a profession, all four of these elements must be examined.

Corrigan and Haberman (1990) stated, "A profession has a clearly defined body of knowledge and skills that is held in common by practitioners in the field and not generally possessed by the lay public. This body of knowledge is undergirded by theory, research, and a set of professional values and ethics" (p. 195). Reynolds (1989) suggested that "knowledge expressed in articulated understandings, skills, and judgments which are professional in character and which distinguish more productive faculty members from less productive ones" (p. ix) forms the knowledge base of the profession.

According to Scheurich (1995), a knowledge base has two major functions, one internal and the other external. Scheurich explained the internal function of a knowledge base as standardizing the training necessary to become a member of the profession in

such a way that it does not matter in which institution a person receives her or his training; she or he will receive basically the same training, at least within some acceptable range of difference. Scheurich (1995) stated that the external function of a knowledge base is to prove to those outside the profession that there exists a body of specialized knowledge and skills, the mastery of which confers special status on its practitioners.

Grossen (1998) noted that a professional knowledge base developed through scientific research is a science; it contains instructional procedures that work well across the profession. “A knowledge base developed in any other way is known as quackery, dogma, superstition, and so forth” (Grossen, 1998, p. 86).

Academic fields such as mathematics, science, and language arts have their knowledge bases or what are sometimes called their national standards. Family and consumer sciences, a complementary vocational field, has recently defined its knowledge base in the form of national standards (National Association of State Administrators for Family and Consumer Sciences, 1998). In 1995, the National Association of State Administrators for Family and Consumer Sciences began to explore how to best provide a strong and clear conceptualization and a common direction for family and consumer sciences at national, state, and local levels. A highly participatory process was utilized including collection of state standards; a variety of meetings with professionals of expertise in all facets of family and consumer sciences education; and input from representatives from businesses, industries, and agencies. The final document

was released in 1998 and articulates the scope and depth of family and consumer sciences education.

Agricultural and extension education as a profession began its examination of the knowledge bases contained within the profession with Hamlin (1949) and Phipps (1972). These two researchers developed a framework for agricultural and extension education at two previous historical points in time. Hamlin's community school policies became the theoretical predecessors to the knowledge bases and contextual applications in agricultural and extension education (Wingenbach & Cummings, 2002). Wingenbach and Cummings (2002) noted that Hamlin outlined his concepts for agricultural education as program objectives and evaluation, program planning, advisory councils and committees (whose function is community needs assessment), relationships between school and community (antecedent to agricultural communications), and procedures for teaching agriculture.

Phipps (1972) proposed a more comprehensive program for agricultural and extension education, which included an occupational orientation and exploration, citizenship, consumer education, applied science, and practical arts. The general objective of Phipps' program was to contribute to the student's ability to think and solve problems efficiently, which required skill in collecting and interpreting data (research). According to Phipps (1972), a quality agricultural and extension education program would aid in the development of desirable attitudes, interests, social sensitivity, and resourcefulness of students.

Williams (1991) notes that research in the field of agricultural and extension education is based in two unique dimensions. These two dimensions that Williams (1991) notes are Discipline and Processes. Barrick (1988) defines agricultural and extension education as “the scientific study of the principles and methods of teaching and learning as they pertain to agriculture” (p. 5). Barrick (1989) also illustrates how agricultural and extension education as a profession has evolved. Barrick (1989) states that agricultural education is rooted in agriculture and education which grew out of biological sciences and applies psychological and sociological theories. During the 1987 North Central Region Committee on Agricultural Education Research the NCA-24 Committee defined agricultural and extension education containing the 10 following core subject areas: 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) divided all of the research areas in agricultural and extension education into four research problem areas. The four areas defined by Buriak and Shinn (1989a) are knowledge base for teaching and learning, curriculum/program planning, delivery methodologies, program relevance and effectiveness. Previous observations of research in the field of agricultural and extension education have developed a scope in which professional within the field have used as guide. This

framework for research has also provided the scope of the knowledge base for the profession of agricultural and extension education. Williams (1991) notes that if agricultural and extension education research is not focused, the discipline will also lack focus (p.8). Research taking place within the profession of agricultural and extension education has been the defining in arriving at our understanding of the knowledge base of agricultural and extension education.

Texas A&M University and Texas Tech University Knowledge Base and Contextual Application Model

In April 2000, the departments of agricultural and extension education at Texas A&M University (TAMU) and Texas Tech University (TTU) conceived an innovative new doctoral program called Doc-at-a-Distance. During the design of this new program, faculty members at TAMU and TTU participated in several strategic planning sessions and identified the collective knowledge base of the two departments. They also identified the varying contexts in which this base of knowledge is applied (contextual applications). In the document created, faculty noted that, “As we engage in strategic planning for our respective programs and for the Joint Doctor of Education program in agricultural and extension education, we need to describe and identify our collective teaching and research capabilities” (Texas A&M University, 2002, p. 2).

In 2003, Baker and Shinn (2003) wrote the following:

Our potential contribution to the academy and the public consists of our knowledge bases of theory beyond any one single contextual application. As a discipline, we are engaged in multiple kinds of scholarly activities including the

scholarship of discovery (development of new knowledge), the scholarship of integration (synthesis in new and existing knowledge), the scholarship of application (application of knowledge in community outreach or engagement), and the scholarship of learning (transmission of knowledge in undergraduate, graduate, and professional education programs). Subsequently, disciplinary scholarship results in the establishment of knowledge bases that are influenced by contextual applications, perceptions, and scholarly techniques. (p. 2)

Questions asked in this planning process by the two universities were: What are our joint knowledge bases and the contextual applications in which we apply that knowledge? How do we describe each knowledge base and each category of contextual application as it relates to this degree program and to the overall mission of our respective departments? (Texas A&M University, 2002)

The work by these two prestigious universities laid important groundwork of the 21st century for conceptualizing the knowledge base of agricultural and extension education nationwide. The five core knowledge bases and their definitions brought forth in these strategic planning sessions of the TAMU and TTU departments of agricultural and extension education model were:

Planning and Needs Assessment: Proactive decision-making that includes defining and analyzing projects, forecasting events, sequencing activities, identifying resources, tracking and managing events, and determining the most effective strategies to realize the objectives.

Learner-Centered Instructional Design: A variety of characteristics, processes, interactions, and delivery methods which contribute to learning in both traditional and distance settings.

Delivery Strategies: Predetermined structures, networks, mediums, and factors related to dissemination of information and/or knowledge and the acquisition of skills, interests, understandings, appreciations, values, and ideals.

Evaluation and Accountability: Evaluation is a systematic study to assess how well a program is working, focusing on achievement of objectives. Performance measurement (accountability) focuses on whether a program has achieved its objectives, expressed as measurable standards.

Research Measurement and Analysis: A systematic and objective search for reliable knowledge through understanding and evaluating the research of others as well as the planning and conducting of original research through quantitative and qualitative methods. (Texas A&M University, 2002)

The capacity in which these two departments (TAMU and TTU) express, research, and articulate these five knowledge bases is defined as a contextual application. Boone (1985) described a contextual application as the extent to which the context facilitates or constrains (or both) the educator's efforts through 1) its mission, philosophy, functions, structures, and processes; 2) its available resources and the means by which those resources are allocated; and 3) its historical relationships to other organizations.

Baker and Shinn (2003) described contextual applications as broad problem areas in which academicians conduct their research. Knowledge bases are expressed in specific contexts within the profession of agricultural and extension education. Knowledge alone is of no use; it must be applied for a purpose or reason. Thus the joint strategic planning sessions between TAMU and TTU brought forth six areas in which the five knowledge bases are applied within the two departments. These six contextual applications were:

Leadership Education: Students study the scholarly discipline of leadership theory and learn theories and models of the leadership process, using analysis and evaluation to synthesize multiple leadership theories.

Extension Education: Delivery of high quality, accessible professional development opportunities for extension professionals so as to enhance competencies in the five knowledge bases in addition to experiential education.

Agricultural Science Teacher Education: Focuses on the unique skills and competencies associated with teaching in youth and/or adult classroom settings, emphasizing curriculum development, program planning, and educational technologies.

Distance Education: The study of enhancement of learning in both asynchronous and synchronous settings at a distance.

International Agricultural Development: Fostering involvement in activities that enhance agricultural development and education in the international arena.

Agricultural Communications: The exchange of accurate information about the agricultural and natural resource industries, ideally through the most effective and efficient channels available using appropriate communication techniques and theories. (Texas A&M University, 2002)

Defining the Knowledge Base for the Profession of Agricultural and Extension Education

While there has been a recent successful inquiry to define the presiding knowledge base and contextual applications for agricultural and extension education at the state level in Texas, there have been no prior attempts to derive the knowledge bases of the entire profession of agricultural and extension education. McCracken (1983) wrote:

It is increasingly essential that agricultural and extension education be further developed as a profession. We need leaders in our profession who will work together in charting a new course for the future. We need intellectual discussions and debate concerning the nature of our program....this intellectual discussion and debate will require of us that we become academicians and philosophers (p. 3).

Agricultural and extension education has gone through many changes and continues to be molded by the guiding trends in agriculture and education. Today's

modern agricultural and extensions education programs offer programs that are very diverse. Today's post secondary student is able to select from a variety of programs such as those based in leadership, technology, communication, and international agriculture. Baker and Shinn (2003) pointed out that to remain viable, agricultural and extension education must change over the course of time. Barrick (1989) in a professorial inaugural lecture to the faculty at Ohio State cautioned, "...an unexamined discipline may not last" (p. 28). Some of Barrick's questions were: What are the core knowledge bases that define the profession as a whole? How can the profession attempt to build a framework of knowledge bases? What avenues of critical thinking will best benefit this process?

The use of critical thinking techniques will be crucial in the search for the knowledge bases under-girding the profession of agricultural and extension education. In order to avoid a haphazard approach to this process, one must make use of the science of critical thinking. Paul (1993) defined critical thinking as "...a systematic way to form and shape one's thinking" (p. 21). Paul stated it is thinking which is responsive to and guided by intellectual standards such as relevance, accuracy, precision, clarity, depth, and breadth. Paul further defined the characteristics of comprehensive critical thinking through the following key points:

A Unique Kind of Purposeful Thinking: Any subject area or topic requires intellectual training for the mind similar to physical fitness for the body.

In Which the Thinker Systematically and Habitually: Actively develops traits such as intellectual integrity, humanity, empathy, and courage.

Imposes Criteria and Intellectual Standards Upon Thinking: Identifies the criteria of solid reasoning, such as relevance, accuracy, depth and establishes a standard for assessment.

Taking Charge of the Construction of Thinking: Awareness of the elements of thought present in all well-reasoned thinking and a conscious effort to address each element.

Guiding the Construction of Thinking According to the Standards: Continual assessment of the construction process including adjusting, adapting, and improving according to criteria and standards.

Assessing the Effectiveness of the Thinking According to Purpose, the Criteria, and the Standards: evaluating the thinking process to determine its strengths and limitations and studying the implications for further thinking and improvement.

Thinking is critical when the thinker can identify the elements of thought that are present in all thinking about any problem, such that the thinker makes the logical connection between the elements and the problem at hand. Paul (1993) stated that the comprehensive critical thinker should routinely ask him or herself the following questions about the subject of the thinking task at hand:

- What **purpose** does my thinking serve?
- What **question** am I trying to answer?
- From what **view point** am I thinking?
- What **information** am I using?
- How do I **interpreting** that information?

- What **concepts** are central to my thinking?
- What **conclusions** am I drawing?
- What **assumptions** am I making?
- What are the **implications**?
- What would the **consequences** of my actions be?

Critical thinking is distinguishable from other thinking because the people are thinking with the awareness of the systematic nature of high quality thought, and are continuously checking up on themselves, striving to improve the quality of thinking. With the use of these guidelines and critical thinking skills, individuals in this study arrived at fundamental and powerful concepts that will define our knowledge base as a profession. The Delphi technique, by its very nature, requires the critical thinking skills outlined by Paul (1993). The individual responding to the Delphi instruments is required to employ the characteristics of critical thinking outlined above and use the questions set forth in making judgments of value and importance.

The Delphi Technique

The Delphi technique refers to a methodology developed at the Rand Corporation in the 1940s designed to elicit expert opinion in a systematic manner (Sackman, 1975). The Delphi technique is a method for the "...systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses" (Delbecq, Van de Ven, & Gustafson, 1975, p.

10). The Delphi research method does not require that participants meet face-to-face. This makes it easy to conduct surveys with qualified people over a wide geographic area.

According to Linstone and Turoff (1975), the Delphi technique is a research method used to organize an effective group communication process in dealing with a complex problem. The Delphi technique also can be used to seek out information that will generate consensus on the part of the respondent group, and it may educate the respondent group as to the diverse and interrelated aspects of the topic.

The Delphi technique uses a panel of experts within a profession to create agreement on "...future alternatives, expected breakthroughs, future opportunities, and value judgments" (Somers, Baker & Isbell, 1984, p. 26). In this study, a panel of experts holding high rank and assuming leadership roles in the profession of agricultural and extension education were chosen to arrive at the knowledge base of the agricultural and extension education profession.

The panel members used in this Delphi technique represented a diverse group with respect to geography. Due to the geographic location of the expert panel, it would have been costly and difficult to assemble the entire group at one location for a face-to-face meeting. Using the Delphi technique eliminated the need for such a meeting in this research. Jones and Twiss (1978) stated that the Delphi technique allows for interaction among members of a group of experts while abating the shortcomings of a face-to-face meeting. The technique also allows for anonymous response, iteration and controlled feedback, and statistical group response (McMillan, 1971).

The Delphi uses a questionnaire that restricts feedback. The members in the group remain anonymous (Jones & Twiss, 1978). Because of the panel's anonymity, it is unlikely that one dominant participant will surface (Porter, Roper, Mason, Rossini, & Banks, 1991). McMillian (1971) stated that anonymity could make group estimates more precise. The possibility that panel members may be swayed to conform to majority opinion can also be alleviated (Martin, 1998).

The Delphi method contains a series of rounds. The first round attempts to gather information for subsequent rounds (Jones & Twiss, 1978). Round I should be a series of open-ended questions in order to insure that initial input gathered from respondents is as unrestricted as possible. The Delphi begins with the initial development of a questionnaire that focuses on the identified problem. An appropriate respondent group is selected, and then the questionnaire is mailed or delivered to them in a manner such as the Internet. Each participant responds to the questionnaire independently and returns it. The responses gathered during Round I should then be used to formulate the questions or statements in successive rounds (Jones & Twiss, 1978). Sackman (1975) listed the following characteristics of the conventional Delphi:

- Data are collected using a structured formal questionnaire administered to a group of subject matter specialists. There is no mandated questionnaire format.
- The Delphi director or may generate the questionnaire items alone or it may be a cooperative effort.
- Participants receive specific instructions for proper completion of the questionnaire.

- The questionnaire is administered to the participants on two or more occasions.
- All administrations of the questionnaire after the first one include statistical feedback from the previous round.
- These statistics are usually measures of central tendency and one of variability.
- The Delphi director may solicit verbal feedback from some participants and publish that information on subsequent rounds.
- Individual responses are always kept anonymous.
- The Delphi director may require written justification for extreme responses.
- The rounds continue until the Delphi director determines that sufficient agreement has been reached.

The initiator of the questionnaire summarizes responses, develops a feedback summary and a second questionnaire for the same respondent group. After reviewing the feedback summary, respondents independently rate priority ideas included in the second questionnaire, and then return their responses. The process is repeated until the investigator feels positions are firm and agreement on a topic is reached. A final summary report is issued to the respondent group.

Each of the rounds provides a channel of communication for the panel and may also provide other pertinent information (Jones & Twiss, 1978). Hect (1979) suggested a ranking of needs and calculations of rank by an importance/consensus method should follow the first round. Feedback to the expert panel in succeeding rounds gives the members insight into the position of the panel. A principle characteristic of this feedback is to allow the panel members to focus on the goals of the Delphi rather than on goals of

the individual members. The Delphi technique requires a director to organize requests for information, to compile information received, and to be responsible for communication with the participants. The Delphi technique requires an efficient communication channel to link the director with each of the participants.

The Delphi is a powerful technique to gain the subjective input of members of an expert panel, but it is not without shortcomings. The Delphi technique can be very time consuming, and costly when compared to other survey methods. The Delphi does have a certain group of critics. Linstone and Turoff (1975) bring light to the fact that the Delphi technique may not always be the best alternative to a face-to-face meeting. Linstone and Turoff (1975) also warn that careful attention must be paid to disagreeing opinions. Disregarding these opinions may result in incomplete surveys.

Despite the drawbacks, Somers, Baker, and Isbell (1984) concluded that the strengths of the technique far outweigh its weaknesses. The Delphi offers decision makers a user-friendly, rigorous, and systematic strategy for collecting and disseminating critical information. Tersine and Riggs (1976) stated that the Delphi technique is a useful tool when a group of experts with diverse backgrounds are involved in decision-making. The technique can also be used to obtain and refine opinions of a group (Brooks, 1979).

Martin (1998) stated that the Delphi appears to be a unique alternative to the more traditional kinds of evaluation and survey work and will likely see continued use in the future of agricultural and extension education research. It continues to be one of the

most extensively used techniques as no better way of using the judgment of experts has yet been developed (Jones & Twiss, 1978).

Internet Use for Data Collection

In this study the Delphi technique was used to collect data through the Internet. There is a growing body of knowledge that indicates that online data collection is appealing and user-friendly. Ladner and Wingenbach, and Raven (2002) found that Web-based and traditional paper-based survey methodologies were equally valid and reliable for social science research.

O'Neill (2004) summarized advantages of collecting survey data online as including reduced costs, higher response rates, lack of geographical boundaries, and fewer responder errors and omissions. She also noted that the cost of surveying is reduced, making larger samples possible. O'Neill (2004) noted that disadvantages included biases inherent in the data collection process in that a portion of the United States population lacks access to the Internet or experience with electronic surveys. There are also security and confidentiality issues. Another limitation in using the Internet is that response rates cannot be calculated unless there is a known and finite group.

Nicholson (2002) reiterated that information technology has made the task of collecting global and local research data simple, cost effective, and reliable. The cost effective feature is attractive to funding agencies and enables studies on a larger scale than was possible with traditional survey techniques.

Summary

The review of literature shows the need for the identification of a knowledge base in the profession of agricultural and extension education. Identifying the knowledge base of the profession on more than a departmental or regional level is necessary to build the philosophical foundation upon which the entire profession is based.

In identifying the core knowledge areas for agricultural and extension education, practitioners and researchers will be better able to predict future trends in agricultural and extension education and may uncover current trends that are coming to the forefront. It is important for researchers in agricultural and extension education to continually investigate the profession to help in articulating a better definition of the profession.

There have been many changes to the agricultural and extension education profession since its inception, and there will continue to be forces shaping what we know today as the profession of agricultural and extension education. The profession has departed from its original purpose of preparing future teachers and extension agents to a profession which now continues to cater to those needs, but has taken on a much more global perspective with the preparation of educators for business, industry, and community agencies. With increasing technology, we have seen improved ways of articulating our knowledge. We have seen a shift in our clientele and old methodologies have been improved to meet the demands of the rapidly changing agricultural industry.

With the use of critical thinking parameters, experts in the field of agricultural and extension education can assist in constructing the knowledge base of the profession through the use of the Delphi technique. The Delphi technique empowers the panel with

an anonymous forum in which to collectively identify the core knowledge areas of our profession.

CHAPTER III

METHODOLOGY

Professionals in agricultural and extension education who are involved in teaching, research, and extension will benefit significantly from the information obtained in this study. This determination of the knowledge base of agricultural and extension education provides professionals within and outside the field parameters that define the scope and boundaries of the profession. It also provides a better understanding of the current direction of this academic field.

Knowledge bases provide a tangible means of communication to be used with other areas of education, community representatives, legislators, business and industry personnel, agriculturists, and agencies. For those within the profession, the establishment of knowledge base provides an opportunity for curriculum development and educational delivery systems that are more uniform across agricultural and extension programs in the United States. In a mobile society this becomes critical for the learner and faculty who may learn and work in many geographical locations during their education and careers. In addition, when program evaluation takes place, the knowledge base provides agreed upon criteria for assessment of quality in programs and accreditations. Problem solving and decision making related to programming, resource acquisition, and distribution are facilitated at the local, state, and national levels when all are speaking the same language.

Selection of the Research Design

The Delphi was used to obtain data for this study. The Delphi technique is a method for the "...systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses" (Delbecq, Van de Ven, & Gustafson, 1975, p. 10). The Delphi research method does not require that participants meet face-to-face. This makes it easy to conduct surveys with qualified people over a wide geographic area.

Use of the Delphi technique was advantageous since the expert panel used in this study was geographically separated, and the researcher wanted to provide effective communication while dealing with a complex issue. The Delphi technique allowed the expert panel to arrive at consensus easily. Three Delphi rounds were used to gather the quality data needed for purposes of this study.

Selection of the Delphi Panel

Delbecq et al. (1975) indicated that the size of the respondent panel used with the Delphi technique is variable. With a homogenous group of people, 10 to 15 participants might be enough. Linstone and Turoff (1975) recommended that 20 members be contacted to participate in the expert panel for a Delphi. Contacting 20 people who are potential candidates for the expert panel tends to ensure that at least 13 experts respond to each round, thereby maintaining validity and reliability (Dalkey, 1969).

Panelists for this study were selected based on their current or former career positions and their expertise in the profession of agricultural and extension education.

Each selected panelist held rank in the agricultural and extension education profession in a department of a college or university and also held or previously had held an advanced leadership position of either as an academic dean or associate dean in a four-year college or university. The population consisted of 24 individuals. Faculty in the Department of Agricultural Education at Texas A&M University nominated these individuals. Contact information was gathered from each panel member's respective institutional Web page.

Once potential experts were identified, a one-page introductory letter was mailed to the potential panelists. The introductory letter explained the purpose of this study and informed each potential panel member of the Web address where the instrument was located. In addition, it explained the data collection process, gave a brief overview of how the Delphi technique would work, and the level of involvement expected of participants. Each panel member had the option of participating by accessing Round I at the indicated Web address. This process defined the members of the expert panel for Round I.

The first feedback received indicating willingness to participate occurred when responses were obtained from Round I. For purposes of this study, the responding sample varied in size and composition from round to round; however, all participants were part of the original panel of 24. The samples consisted of 16 respondents for Round I, 14 respondents for Round II, and 17 respondents for Round III.

Development of the Research Instrument

To alleviate the cost of mailing each of the survey instruments, this study employed the use of a Web-based survey instrument. Ladner, Wingenbach, and Raven

(2002) found that Web-based and traditional paper-based survey methodologies were equally valid and reliable for social science research. The Web site used for this study contained all of the important information regarding the study. This enhanced communication between the researcher and respondents, also made it easier for the respondents to complete each survey.

The introductory letter (Appendix A), which was e-mailed to each potential panelist, explained the method of data collection. The panelists were not made aware of others participating in this research project. As explained above, the panelists who chose to participate accessed on line the survey instrument and research project information. After the completion of each round, panel members were given feedback based on how the group responded in the previous round and a set of instructions on how to access the next questionnaire.

Round I contained a narrative (Appendix B) that defined the meaning of knowledge bases and contextual applications. Panel members were asked to use these definitions to list, on the Web-based instrument, the articulated understandings, skills, and judgments that they felt served as the foundation (the "body") of knowledge for professionals in agricultural and extension education. The responses given to the question in Round I were divergent in nature. The 16 participants who responded to Round I generated a lengthy list of answers to the question. The statements that each panel member wrote were in narrative format. The statements were then separated in such a way that they would stand alone as one idea or thought. Ninety-five unique statements were identified by the respondents in round one.

Round II of the Delphi was based on the data collected from Round I. The list of 95 knowledge areas that were compiled from Round I were placed in random order for Round II. This list was then posted on the Web site with specific directions for Round II (Appendix C). These directions requested participants to rate each knowledge area in terms of its importance to the knowledge base of the profession. A Likert type response format was used.

Each statement was placed on the left of the page followed by the numerical choices 1 through 6 for rating each statement. The scale ratings were 1 indicating “Strongly Disagree”; 2, “Disagree”; 3, “Somewhat Disagree”; 4, “Somewhat Agree”; 5, “Agree”; and 6, “Strongly Agree”. Participants simply clicked on their response choice. A total of 17 individuals participated in Round II. Participants’ ratings from Round II were tallied. If statements received “agreed” or “strongly agreed” ratings from less than two-thirds, or 10, of the respondents in Round II, they were deleted from Round III. From the original 95 items in Round II, 28 statements were deleted because less than two-thirds of the respondents agreed or strongly agreed that they should be part of the knowledge base, leaving 67 statements for Round III. However, one additional item was added by a respondent in Round II as being important for the knowledge base.

During the course of Rounds II and III, respondents were given the opportunity to add or restate an item if they felt the original integrity was lost during the separating of the original items from the narratives in Round I. Thus, the total number of items presented in Round III was 68.

The 68 statements for Round III of the Delphi were then posted on line with another set of directions asking panel members to review this master list of constructs and indicate how they would rate each area using the same Likert-type format as used in Round II. The panel members were also given the rating frequencies generated from Round II for each item that remained in Round III. In other words, the results of round II were shared with all panel members. Each panel member then rated each item again. At the end of Round III, three statements were dropped because they did not achieve two-thirds consensus.

Analysis of Data

The knowledge areas collected in Round I were formulated into constructs for use in successive rounds. The data analysis resulted in 68 knowledge areas proposed by the panel members. Once these statements were rated in Round II, the data were analyzed using frequency counts and percentages. The ratings of each of the experts were placed in a database. The statements that were dropped in Round II had below two-thirds agreement regarding their importance. The statements that received above two-thirds were placed into the Round III instrument. The statements were accompanied in Round III with the frequency counts for each level of agreement that they generated from the panel in Round II. This method provided the respondents with knowledge of how items were rated by the entire expert panel.

The statements from Round III underwent the same elimination procedure. Items that received less than two-thirds agreement were dropped, and items with more than two-thirds of the panel members agreeing were part of the articulated understandings,

skills, and judgments that they felt served as the foundation of knowledge (the "body") for professionals in agricultural and extension education.

CHAPTER IV

FINDINGS

The purpose of this chapter is to present the findings of this investigation undertaken to identify the knowledge base of the profession of agricultural and extension education nationwide. This chapter serves as a forum for presenting the areas of knowledge that were identified as most important in defining the profession of agricultural and extension education. These constructs are the identifying markers of agricultural and extension education that the Delphi panel agreed upon through group consensus during Round I, Round II, and Round III of the study.

Each of the three rounds was unique in its own role in arrival at the knowledge base of agricultural and extension education. A minimum of 13 respondents was required for each round of the Delphi technique as used in this study. Round I contained responses from 16 panel members, Round II consisted of the responses of 14 panel members, and Round III had responses from 17 individuals. The cut off for inclusion of statements in Round III from Round II was a two-thirds consensus of the panel members. That is, two thirds of the panel members had to either agree or strongly agree with a statement in Round III for the item to remain. The items remaining with a two-thirds consensus after Round III are presented as the knowledge base of agricultural and extension education.

Findings Related to Research Question 1

Question 1: What are the core knowledge areas identified by experts in agricultural and extension education in the United States that compose the common knowledge base of the profession?

The respondents in Round I were asked the following open ended question:

“What are the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the "body") for professionals in Agricultural and extension education?” Table 1 includes 95 statements that resulted from the separation and compilation of the responses given in narrative form in response to this open-ended question.

Table 1

Agricultural and Extension Education Knowledge Bases: Delphi Round I

Statement of Knowledge Base

Dedicated, honest, of high character, hardworking, and trustworthy.
 Be flexible and willing to stay current in their specific knowledge base.
 Believes professional responsibilities extend beyond the classroom.
 Effectively manages the classroom to optimize learning.
 Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.
 Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.
 Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.
 Focuses on knowing as well as applying knowledge to real-life situations.
 Applies appropriate communication skills - written and oral.
 Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.
 Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.
 Disseminates results of learning from practice and research.

Table 1 (continued).

Statement of Knowledge Base
Maintains effective classroom management that enables students to become self-directed.
Is positive, enthusiastic, and committed to students in their developmental period.
Motivates learners.
Thinks creatively and critically.
Values the right of students to develop their own identities and to pursue their own personal goals.
Knows the goals, limitations, and appropriateness of various methods of instruction.
Has experienced professional preparation of instructors.
Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.
Manages time and sets priorities.
Understands and uses formal and informal assessment strategies to evaluate learning and impact.
Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.
Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.
Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.
Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.
Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).
Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.
Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.
Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.
Broad base agricultural knowledge that is communicated to learners.
Acts as an advocate for students in the larger community as well as in school.
Engages in formative and summative program evaluation with others.
Employs communications skills in large and small group settings and with individuals.
Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.
Incorporates authentic strategies for evaluation of students and curricula.
Leadership and personal skills development.
Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.
Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.

Table 1 (continued).

Statement of Knowledge Base
Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.
Uses a leadership style that is flexible to a variety of situations.
Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.
Understands his/her responsibility to the community.
Plans instruction to support the development of individual student identity and goals.
Understands the range of developmental characteristics of adolescents including interpersonal, cultural, and societal contexts.
Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.
Understands the importance of the school in fostering democratic principles and good citizenship.
Uses effective communications to promote active learning, collaboration, and interaction.
Uses knowledge of students' developmental characteristics to facilitate student learning.
Collaborates with colleagues, other professionals, and other constituents to assess needs, problem-solve, brainstorm, and research new ideas to improve education for all students.
Collaborates with community businesses to provide instructional experiences designed to increase student awareness and to link students with career opportunities within the local community.
Formulates research studies, completes a research project, reports results and applies those results to actual instructional settings.
Knows how to integrate subject disciplines in order to demonstrate the connections that exist between knowledge and life.
Understands components, principles, and theories of adolescent and young adult development.
Participates in continual professional development in the teaching/learning processes.
Respects and appreciates the range of individual developmental differences.
Uses appropriate analytical techniques to research agricultural and educational problems.
Values the importance of co-curricular and extra-curricular activities as an essential part of the high school mission.
Works with resource persons and community groups to promote student learning and citizenship.
Values the opportunity to work with a diverse population.
While sharing a common level of understanding, agricultural and extension education and extension education have distinct basic building blocks distinguished by formal and non formal education.
Believes that technology enriches student experiences.
Acknowledges the importance of a broad understanding of cultural and global diversity for teachers and students.

Table 1 (continued).

Statement of Knowledge Base
Knows supplementary resources available to promote effective instruction.
Integrates career education preparation experiences into learning activities that provide students with necessary workplace skills and awareness.
Provides experiences that increase the learner's knowledge of global issues.
Recognizes and acknowledges the broad spectrum of a student's experience within the culture of the community.
Takes into account unique family needs that affect student learning.
Understands the educational impact of exponential advances in technology.
The underlying theoretical base for extension is grounded in reflective practice.
Understands the importance of diversity in the school population and in the curriculum, instruction, and assessment of all students.
Is attentive to indications of challenges or difficulties that may affect healthy development.
Is committed to working with families and other adults to promote healthy development of adolescents and young adults.
Provides students with interdisciplinary and integrated learning experiences involving several curricular areas to link knowledge, skills, and methods of inquiry to real life applications.
Understands the diversity of family structures among adolescents and young adults and the implications of that diversity.
Bases the program on sound science, connected to basic science, for higher order learning.
Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.
Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.
Applies critical thinking skills to solve educational and agricultural problems.
Integrates technology into teaching and learning.
Establishes respectful and productive relationships and partnerships to support students' learning and well
Knows how to apply inductive and deductive reasoning in the critical thinking process.
Invites student, parent, and community input into the development of the curriculum.
Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.
Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.
Involves all areas related to the dissemination of information to the general public in specific subject matters as defined by the USDA.
Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).

Table 1 (continued).

Statement of Knowledge Base
Recognizes the skills necessary to assure equity.
Leadership training transcends all career activities and responsibilities.
Teams with colleagues to discuss students' needs and to collaborate in developing programs that address the developmental needs of adolescents and young adults.
Understands the high school environment as an organization within the larger community context.
Utilizes school and community resources to support the healthy intellectual, social, and personal development of adolescents and young adults.
Youth development is provided by extension education through 4-H.
Accesses technologies to support quality instruction.

Fourteen individuals from the expert panel responded to the 95 statements presented to them in Round II. Each respondent in Round II rated their level of agreement with each of the 95 statements part of the articulated understandings, skills, and judgments that serve as the foundation of knowledge for professionals in agricultural and extension education. Panel members reported their levels of agreement recorded using a Likert-type scale (1 = “Strongly Disagree”, 2 = “Disagree”, 3 = “Somewhat Disagree”, 4 = “Somewhat Agree”, 5 = “Agree”, and 6 = “Strongly Agree”). The frequencies and percentages for each of the statements from Round II are shown in Table 2. In order to receive two-thirds consensus in Round II and be retained for Round III, each statement had to have ten or more respondents in Round II who agreed (5) or strongly agreed (6) that the statement was a part of the articulated understandings, skills, and judgments that serve as the foundation of knowledge for professionals in agricultural and extension education. At the end of Round II, respondents were given the opportunity to resubmit any of their statements from Round I that they thought were left off or changed from their original intent. One statement was added during Round II.

Table 2
*Descriptive Statistics for Agricultural and Extension Education Knowledge Bases:
 Delphi Round II (N=14)*

Statement of Knowledge Base	<i>f</i> ^a	Percent
Dedicated, honest, of high character, hardworking, and trustworthy.	14	100.0
Be flexible and willing to stay current in their specific knowledge base.	14	100.0
Believes professional responsibilities extend beyond the classroom.	14	100.0
Effectively manages the classroom to optimize learning.	14	100.0
Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.	14	100.0
Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.	13	92.9
Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.	13	92.8
Focuses on knowing as well as applying knowledge to real-life situations.	13	92.9
Applies appropriate communication skills - written and oral.	13	92.8
Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.	13	92.8
Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.	13	92.9
Disseminates results of learning from practice and research.	13	92.9
Maintains effective classroom management that enables students to become self-directed.	13	92.9
Is positive, enthusiastic, and committed to students in their developmental period.	13	92.9
Motivates learners.	13	92.9
Thinks creatively and critically.	13	92.9
Values the right of students to develop their own identities and to pursue their own personal goals.	13	92.9
Knows the goals, limitations, and appropriateness of various methods of instruction.	12	85.7
Has experienced professional preparation of instructors.	12	85.7
Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.	12	85.7
Manages time and sets priorities.	12	85.7
Understands and uses formal and informal assessment strategies to evaluate learning and impact.	12	85.7
Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.	12	85.7
Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.	12	85.7

Table 2 (continued).

Statement of Knowledge Base	<i>f</i> ^a	Percent
Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.	12	85.7
Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.	12	85.7
Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).	12	85.7
Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.	12	85.7
Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.	11	78.6
Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.	11	78.6
Broad base agricultural knowledge that is communicated to learners.	11	78.6
Acts as an advocate for students in the larger community as well as in school.	11	78.6
Engages in formative and summative program evaluation with others.	11	78.6
Employs communications skills in large and small group settings and with individuals.	11	78.6
Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.	11	78.6
Incorporates authentic strategies for evaluation of students and curricula.	11	78.6
Leadership and personal skills development.	11	78.6
Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.	11	78.6
Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.	11	78.6
Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.	11	78.6
. Uses a leadership style that is flexible to a variety of situations.	11	78.6
Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.	11	78.6
Understands his/her responsibility to the community.	11	78.6
Plans instruction to support the development of individual student identity and goals.	11	78.6
Understands the range of developmental characteristics of adolescents including interpersonal, cultural, and societal contexts.	11	78.6
Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.	11	78.6

Table 2 (continued).

Statement of Knowledge Base	<i>f</i> ^a	Percent
Utilizes school and community resources to support the healthy intellectual, social, and personal development of adolescents and young adults.	11	78.6
Youth development is provided by extension education through 4-H.	11	78.6
Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.	11	78.6
Bases the program on sound science, connected to basic sciences.	10	71.4
Aspires for higher order learning.	10	71.4
Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.	10	71.4
Applies critical thinking skills to solve educational and agricultural problems.	10	71.4
Integrates technology into teaching and learning.	10	71.4
Establishes respectful and productive relationships and partnerships to support students' learning and well-being.	10	71.4
Knows how to apply inductive and deductive reasoning in the critical thinking process.	10	71.4
Invites student, parent, and community input into the development of the curriculum.	10	71.4
Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.	10	71.4
Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.	10	71.4
Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).	10	71.4
Leadership training transcends all career activities and responsibilities.	10	71.4
Recognizes the skills necessary to assure equity.	10	71.4
Teams with colleagues to discuss students' needs and to collaborate in developing programs that address the developmental needs of adolescents and young adults.	10	71.4
Understands the high school environment as an organization within the larger community context.	10	71.4
Understands the importance of the school in fostering democratic principles and good citizenship.	10	71.4
Uses effective communications to promote active learning, collaboration, and interaction.	10	71.4
Uses knowledge of students' developmental characteristics to facilitate student learning.	10	71.4

Note. ^aFrequency counts represent those respondents who agreed or strongly agreed with the statement.

There were a total of 28 statements that did not achieve a two-thirds consensus in Round II. A total of 68 statements were presented to the panel members in Round III. The 67 statements that were agreed upon by the expert panel in Round II as being a part of the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the "body") for professionals in agricultural and extension education are presented in Table 2. There was one statement added by a panel member during Round II that was presented in Round III. That statement was "Motivation is intrinsic. Teacher creates an environment which allows a student to motivate themselves to learn." This resulted in a total of 68 statements included in Round III.

Findings Related to Research Question 2

Question 2: How do the core knowledge areas identified by experts rank in terms of order of importance to the knowledge base of the profession of agricultural and extension education?

Round III of this Delphi study had total of 17 expert panel respondents who rated the 67 statements that achieved a two-thirds consensus from Round II. Panel members were presented the frequencies of levels of agreement from Round II.

Each respondent in Round III rated their level of agreement with regard for each statement as being a part of the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the "body") for professionals in agricultural and extension education. Levels of agreement were recorded using a Likert-type scale (1 = "Strongly Disagree", 2 = "Disagree", 3 = "Somewhat Disagree", 4 = "Somewhat

Agree”, 5 = “Agree”, and 6 = “Strongly Agree”). Table 3 contains the statements from Round III in the order of their level of importance. The percentage in this table is the percentage of respondents who agreed (5) or strongly agreed (6) that the item was part of the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the "body") for professionals in agricultural and extension education.

After completion of Round III, items that did not receive a two-thirds consensus from the participants were removed from the list of statements. Each statement had to have a total frequency of greater than 12 to be included in the final list. A total of three statements did not receive two-thirds consensus in Round III, leaving 65 statements that describe the knowledge base of agricultural and extension education. These statements are found in Table 3.

Table 3
*Descriptive Statistics for Agricultural and Extension Education Knowledge Bases:
Delphi Round III (N=17)*

Statement	<i>f</i> ^a	Percent
Bases the program on sound science, connected to basic sciences.	17	100.0
Dedicated, honest, of high character, hardworking, and trustworthy.	17	100.0
Applies appropriate communication skills - written and oral.	17	100.0
Be flexible and willing to stay current in their specific knowledge base.	17	100.0
Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.	17	100.0
Employs communications skills in large and small group settings and with individuals.	17	100.0
Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.	17	100.0
Effectively manages the classroom to optimize learning.	17	100.0
Leadership and personal skills development.	17	100.0

Table 3 (continued).

Statement of Knowledge Base	<i>f</i> ^a	Percent
Maintains effective classroom management that enables students to become self-directed.	17	100.0
Is positive, enthusiastic, and committed to students in their developmental period.	17	100.0
Manages time and sets priorities.	17	100.0
Understands and uses formal and informal assessment strategies to evaluate learning and impact.	17	100.0
Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.	17	100.0
Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.	17	100.0
Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.	17	100.0
Motivates learners.	17	100.0
Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.	16	94.2
Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.	16	94.1
Focuses on knowing as well as applying knowledge to real-life situations.	16	94.1
Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.	16	94.1
Believes professional responsibilities extend beyond the classroom.	16	94.1
Disseminates results of learning from practice and research.	16	94.1
Engages in formative and summative program evaluation with others.	16	94.1
Integrates technology into teaching and learning.	16	94.1
Invites student, parent, and community input into the development of the curriculum.	16	94.1
Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.	16	94.1
Knows the goals, limitations, and appropriateness of various methods of instruction.	16	94.1
Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.	16	94.1
Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.	16	94.1
Thinks creatively and critically.	16	94.1
Understands the importance of the school in fostering democratic principles and good citizenship.	16	94.1

Table 3 (continued).

Statement of Knowledge Base	<i>f</i> ^a	Percent
Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).	16	94.1
Uses effective communications to promote active learning, collaboration, and interaction.	16	94.1
Aspires for higher order learning.	15	88.2
Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.	15	88.3
Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.	15	88.2
Applies critical thinking skills to solve educational and agricultural problems.	15	88.2
Establishes respectful and productive relationships and partnerships to support students' learning and well-being.	15	88.2
Knows how to apply inductive and deductive reasoning in the critical thinking process.	15	88.2
Has experienced professional preparation of instructors.	15	88.2
Incorporates authentic strategies for evaluation of students and curricula.	15	88.2
Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.	15	88.2
Leadership training transcends all career activities and responsibilities.	15	88.2
Uses a leadership style that is flexible to a variety of situations.	15	88.2
Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.	15	88.2
Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.	15	88.2
Uses knowledge of students' developmental characteristics to facilitate student learning.	15	88.2
Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.	14	82.4
Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.	14	82.4
Broad base agricultural knowledge that is communicated to learners.	14	82.4
Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).	14	82.4
Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.	14	82.4

Table 3 (continued)

Statement of Knowledge Base	<i>f</i> ^a	Percent
Youth development is provided by extension education through 4-H.	14	82.4
Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.	14	82.4
Acts as an advocate for students in the larger community as well as in school.	13	76.4
Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.	13	76.4
Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.	13	76.4
Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.	13	76.4
Understands the high school environment as an organization within the larger community context.	13	76.4
Motivation is intrinsic. Teacher creates an environment which allows a student to motivate themselves to learn.	13	76.4
Understands his/her responsibility to the community.	12	70.6
Plans instruction to support the development of individual student identity and goals.	12	70.6
While sharing a common level of understanding, agricultural and extension education and extension education have distinct basic building blocks distinguished by formal and non formal education.	12	70.6
Values the right of students to develop their own identities and to pursue their own personal goals.	12	70.6

Note. ^aFrequency counts represent those respondents who agreed or strongly agreed with the statement.

Summary

The use of three rounds of the Delphi technique resulted in the establishment of 65 statements that constitute the knowledge bases of the agricultural and extension education profession. Leaders in the field of agricultural and extension education served as panel members responding online to three rounds of the Delphi technique. Round I generated 95 statements in response to an open-ended question. Based on levels of agreement in Round II, 28 of these items were eliminated due to lack of consensus on

agreement regarding inclusion in the knowledge base, leaving 67 items. One item was added at this point. Of the 68 statements presented to the panel of experts in Round III, three additional items were eliminated. There were a total of 65 statements that defined the profession of agricultural and extension education.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A summary of this study, a discussion of the conclusions drawn from the findings, and recommendations for further action are presented in this chapter.

Summary of the Study

A panel of experts consisting of agricultural and extension education leaders from across the United States responded to open-ended questions to identify individual statements that might define the knowledge base of agricultural and extension education. Then they rated the edited statements using a Likert response scale on-line as a part of the Delphi technique to establish the knowledge base for agricultural and extension education. Three rounds of the Delphi technique were used. A minimum of 13 of the 24 panel members were required to respond to each round of the study. A consensus level of two-thirds of the respondents was established for Rounds II and III which required that the panel members indicate their level of agreement (Strongly Agree and Agree) with statements generated in Round I.

Ninety-five (95) statements were initially generated from input of 16 panel members in response to an open-ended question in Round I. These 95 statements were presented to the respondents in a Likert-type format in Round II. Fourteen panel members responded to Round II. Based on their ratings 67 of the statements received ratings of agree or strongly agree and were retained for Round III. One statement was added at this point for a total of 68 statements being presented to the panel in Round III. Seventeen panel members responded to Round III. The cut off point for agreement

eliminated three statements in Round III that established the knowledge base for agriculture and extension education, found in Table 4.

Table 4

Knowledge Base of Agricultural and Extension Education

Statement of Knowledge Base

Bases the program on sound science, connected to basic sciences.
 Dedicated, honest, of high character, hardworking, and trustworthy.
 Applies appropriate communication skills - written and oral.
 Be flexible and willing to stay current in their specific knowledge base.
 Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.
 Employs communications skills in large and small group settings and with individuals.
 Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.
 Effectively manages the classroom to optimize learning.
 Leadership and personal skills development.
 Maintains effective classroom management that enables students to become self-directed.
 Is positive, enthusiastic, and committed to students in their developmental period.
 Manages time and sets priorities.
 Understands and uses formal and informal assessment strategies to evaluate learning and impact.
 Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.
 Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.
 Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.
 Motivates learners.
 Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.
 Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.
 Focuses on knowing as well as applying knowledge to real-life situations.
 Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.
 Believes professional responsibilities extend beyond the classroom.
 Disseminates results of learning from practice and research.

Table 4 (continued).

Statement of Knowledge Base

Engages in formative and summative program evaluation with others.

Integrates technology into teaching and learning.

Invites student, parent, and community input into the development of the curriculum.

Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.

Knows the goals, limitations, and appropriateness of various methods of instruction.

Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.

Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.

Thinks creatively and critically.

Understands the importance of the school in fostering democratic principles and good citizenship.

Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).

Uses effective communications to promote active learning, collaboration, and interaction.

Aspires for higher order learning.

Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.

Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.

Applies critical thinking skills to solve educational and agricultural problems.

Establishes respectful and productive relationships and partnerships to support students' learning and well-being.

Knows how to apply inductive and deductive reasoning in the critical thinking process.

Has experienced professional preparation of instructors.

Incorporates authentic strategies for evaluation of students and curricula.

Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.

Leadership training transcends all career activities and responsibilities.

Uses a leadership style that is flexible to a variety of situations.

Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.

Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.

Uses knowledge of students' developmental characteristics to facilitate student learning.

Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.

Table 4 (continued).

Statement of Knowledge Base

Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.

Broad base agricultural knowledge that is communicated to learners.

Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).

Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.

Youth development is provided by extension education through 4-H.

Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.

Acts as an advocate for students in the larger community as well as in school.

Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.

Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.

Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.

Understands the high school environment as an organization within the larger community context.

Motivation is intrinsic. Teacher creates an environment which allows a student to motivate themselves to learn.

Understands his/her responsibility to the community.

Plans instruction to support the development of individual student identity and goals.

While sharing a common level of understanding, agricultural and extension education and extension education have distinct basic building blocks distinguished by formal and non formal education.

Values the right of students to develop their own identities and to pursue their own personal goals.

Conclusion

A group of agricultural and extension education leaders from across the United States were able to propose concepts for the knowledge base of agricultural and extension education, and reach agreement on the areas of greatest importance. It appears that the articulation of the knowledge base in this profession is a topic of much interest and concern to those in the profession. The fact that as many as 17 out of 24 individuals

took time and participated in at least one of the rounds of this study indicated commitment on the part of this population to the determination of this knowledge base.

Consensus is reflected in the fact that when initially presented with 95 statements, 67 remained in the pool after two rounds of panel participation. It is evident that there is agreement among the leaders in this profession on this knowledge base. It can be concluded that three rounds of participation were sufficient for the panel members since only three statements were deleted by the panel in Round III. If a larger number had failed to obtain consensus, another round might have been warranted. It appears that the Delphi technique, in an online format was appealing and convenient for the respondents. The ease of response is a testimony to the clarity of the directions utilized for each round.

Looking at the 65 final statements generated for the knowledge base, one can see clusters of knowledge areas emerge. The following 13 clusters are identified:

- Characteristics of effective professional educators.
- Personal and classroom management.
- Impacts on instruction.
- Contextual, applied learning.
- Pedagogical practices.
- Theoretical bases for agricultural curriculum and instruction.
- Leadership development.
- Communication strategies.
- Critical thinking and decision making strategies.

- Assessment strategies.
- Collaboration with colleagues and community.
- Technology.
- Teaching as a changing process.

Table 5 contains these 13 clusters each followed by the knowledge base statements that the researcher feels are affiliated with each cluster.

Table 5

Proposed Clustering of Agricultural and Extension Education Knowledge Bases

Characteristics of Effective Professional Educators

Dedicated, honest, of high character, hardworking, and trustworthy.

Be flexible and willing to stay current in their specific knowledge base.

Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.

Is positive, enthusiastic, and committed to students in their developmental period.

Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.

Believes professional responsibilities extend beyond the classroom.

Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.

Has experienced professional preparation of instructors.

Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.

Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).

Disseminates results of learning from practice and research.

Personal and Classroom Management

Effectively manages the classroom to optimize learning.

Maintains effective classroom management that enables students to become self-directed.

Manages time and sets priorities.

Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.

Table 5 (continued).

Impacts on Instruction

Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.

Understands the high school environment as an organization within the larger community context.

Uses knowledge of students' developmental characteristics to facilitate student learning.

Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).

Values the right of students to develop their own identities and to pursue their own personal goals.

Contextual, Applied Learning

Focuses on knowing as well as applying knowledge to real-life situations.

Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.

Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.

Pedagogical Practices to Meet Learner Needs

Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.

Table 5 (continued).

Knows the goals, limitations, and appropriateness of various methods of instruction.

Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.

Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.

Motivates learners.

Motivation is intrinsic. Teacher creates an environment which allows a student to motivate themselves to learn.

Plans instruction to support the development of individual student identity and goals.

Table 5 (continued).

Theoretical Bases for Agricultural Curriculum and Instruction

Bases the program on sound science, connected to basic sciences.

Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.

Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.

Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.

Broad base agricultural knowledge that is communicated to learners.

Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.

Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.

Leadership Development

Leadership and personal skills development.

Leadership training transcends all career activities and responsibilities.

Uses a leadership style that is flexible to a variety of situations.

Youth development is provided by extension education through 4-H.

Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.

Communication Strategies

Applies appropriate communication skills - written and oral.

Employs communications skills in large and small group settings and with individuals.

Uses effective communications to promote active learning, collaboration, and interaction.

Critical Thinking and Decision Making Strategies

Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.

Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.

Thinks creatively and critically.

Aspires for higher order learning.

Applies critical thinking skills to solve educational and agricultural problems.

Knows how to apply inductive and deductive reasoning in the critical thinking process.

Table 5 (continued).

<p>Assessment Strategies</p> <p>Understands and uses formal and informal assessment strategies to evaluate learning and impact.</p> <p>Engages in formative and summative program evaluation with others.</p> <p>Incorporates authentic strategies for evaluation of students and curricula.</p>
<p>Collaborations with Colleagues and Community</p> <p>Invites student, parent, and community input into the development of the curriculum.</p> <p>Understands the importance of the school in fostering democratic principles and good citizenship.</p> <p>Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.</p> <p>Establishes respectful and productive relationships and partnerships to support students' learning and well-being.</p> <p>Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.</p> <p>Acts as an advocate for students in the larger community as well as in school.</p> <p>Understands his/her responsibility to the community.</p> <p>While sharing a common level of understanding, agricultural and extension education and extension education have distinct basic building blocks distinguished by formal and non formal education.</p>
<p>Technology</p> <p>Integrates technology into teaching and learning.</p>
<p>Teaching as a Changing Process</p> <p>Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.</p> <p>Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.</p> <p>Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).</p>

It appears that the largest number of knowledge base statements identified by a national panel for agricultural and extension education fall into a cluster related to “Characteristics of Professional Educators.” The next largest clusters deal with “Pedagogical Practice,” “Theoretical Basis for Agricultural Curriculum and Instruction,”

“Critical Thinking and Decision Making,” and “Collaboration with Colleagues and Community.” These are the cluster areas most critical to the knowledge base for the agricultural and extension education profession. These clusters need to be tested using a national sample of professionals within the field of agricultural and extension education. The statements were assigned a cluster based on the researchers proposed grouping.

When comparing the knowledge bases of the agricultural and extension education profession arrived at in this study to those proposed by Hamlin (1949) as being a part of the knowledge base of the profession, one notices similarities and differences. Hamlin’s (1949) knowledge bases included program objectives and evaluation, program planning, advisory councils and committees, relationships between school and community, and procedures for teaching agricultural and extension education. The knowledge bases from this study which overlap with Hamlin’s knowledge bases include program evaluation/assessment, program planning and implementation, and school community connections. Hamlin (1949) did not propose several of the knowledge areas that clearly emerged in this study. New to this study were areas related to characteristics of the professional, management issues, impacts on instruction, leadership and communication strategies, critical thinking and decision making, the application of technology, and the changing nature of teaching.

According to Phipps (1972) a quality agricultural and extension education program would aid in the development of desirable attitudes, interests, social sensitivity, and resourcefulness of students. He felt that a comprehensive agricultural and extension education program included occupational orientation and exploration, citizenship,

consumer education, applied education, and practical arts. Those areas that did not appear as part of the knowledge base in this study were the occupational focus, consumer education, practical arts, and the affective components noted above. The current knowledge bases are much broader and comprehensive than those proposed by Phipps. New areas that emerged in this study were characteristics of professionals, management issues, impacts on instructions, pedagogical practices, theoretical bases for curriculum instruction, leadership development, critical thinking and decision making strategies, assessment, community collaborations, technology, and teaching as a process.

The results of this study do seem to closely follow the framework that Buriak and Shinn (1998a) laid forth with their research categories. The four areas defined by Buriak and Shinn (1989a) were a knowledge base for teaching and learning, curriculum/program planning, delivery methodologies, program relevance, and effectiveness. Many of the 65 statements that define the knowledge base of agricultural and extension education are related to these four areas. Buriak and Shinn's (1989a) four areas closely parallel four of the clusters proposed by this researcher.

It may also be concluded that the panel members tended to agree that the focus on secondary agricultural education is still vital to the profession. Many of the statements that remained through Round III are centered pedagogical processes in the secondary classroom. Many of the statements that define the knowledge base of agricultural and extension education may be applicable to the post-secondary educational setting.

Recommendations for Further Study and Action

The researcher proposes the following foci for further study and action to validate the knowledge base established in this research:

- Have new/recent graduates, secondary agriculture teachers, extension agents, and agriculturists in business and industry from across the country review and rate the knowledge statements.
- Assess major agricultural and extension education collegiate programs in terms of how they are disseminating these knowledge bases in their curricula. Select a sample of degree plans from leading universities with programs in agricultural and extension education and assess the degree to which the knowledge base established in this study is being addressed.
- Have a group of recent agricultural and extension education graduates and undergraduates rate these knowledge statements in terms of how competent they feel they are.
- Develop a plan or strategy for utilization of the knowledge base statements for program assessment.
- Compare the knowledge bases in agricultural and extension education with those in core areas of math and science, to note areas of integration and overlap which assist in justifying the program of agricultural and extension education as being supportive of other vocational and academic areas.
- Ask high school principals and other administrators to rate these knowledge areas in terms of importance to their programs.

- Reassess the relevance of these knowledge base statements in light of societal, agricultural, and technological changes at ten year intervals in the future.
- Test the clustering of the 65 knowledge base statements by a national panel of experts.

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APPENDIX A
PANEL MEMBER
INTRODUCTORY LETTER

March 1, 2004

Subject's Title

Subject's Address

Dear Subject:

Howdy from Texas A&M University's Department of Agricultural Education! You have been selected as one of several potential panelists nationwide who we are asking to participate in a study designed to help identify the knowledge base of the profession of agricultural and extension education. You have been selected to participate in this study based on your professional experience in agricultural and extension education and your current or past career positions.

We know that you are very busy, and therefore we have designed a Web-based instrument for convenience purposes. We are asking for your participation in a series of Delphi rounds from March through the first part of April 2004. This study is targeted at a national level. It is unique in that it will help us identify what collective knowledge is common to our profession. Please access the first round of the Delphi instrument at the following Web address:

<http://www.ag-communicators.org/surveys/AGEDKBCconsent.htm>

Your participation in this study is greatly appreciated. If you have any questions please feel free to contact Gregory Cummings or Gary Briers in the Department of Agricultural Education at Texas A&M University.

Sincerely,

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APPENDIX B
ROUND I INSTRUMENT

**AGRICULTURAL AND EXTENSION
EDUCATION KNOWLEDGE BASES
DELPHI STUDY ROUND I**

“Knowledge Base” may be derived from the working definitions listed below. Please read the definitions carefully, then respond to the question that follows. A knowledge base is defined as:

- The content of a particular domain or field of knowledge. Knowledge expressed in articulated understandings, skills, and judgments which are professional in character and which distinguish more productive [faculty] from less productive ones (Reynolds, 1989).
- A body of knowledge under-girded by theory, research, and a set of professional values and ethics (Corrigan & Haberman, 1990).
- The core of what makes a profession unique and distinguishable from other professions (Corrigan & Haberman, 1990).
- A clearly defined body of knowledge and skills that is held in common by practitioners in the field and not generally possessed by the lay public (Corrigan & Haberman, 1990).
- Knowledge developed through scientific research; it contains instructional procedures that work well across the profession (Grossen, 1998).

What are the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the “body”) for professionals in agricultural and extension education?

(Please submit your answers in succinct statements or phrases.)

Additional Information:

How many years of experience do you have in the agricultural and extension education profession?

What is your current position status? University President, College Dean, Associate/Assistant Dean, Extension Director, Associate/Assistant Extension Director

APPENDIX C
ROUND II INSTRUMENT

**AGRICULTURAL AND EXTENSION
EDUCATION KNOWLEDGE BASES
DELPHI STUDY ROUND II**

In the first round of this survey, you and colleagues identified statements (listed below in no particular order) to describe the knowledge base of Agricultural and Extension Education. All statements were included in this second round; however, some statements may have been dissected and/or converged with duplicate statements by other experts. If you feel the context or integrity of your statement was lost, please re-submit and rate your statement(s) in the boxes provided at the end of the survey.

Instructions: Each of the following statements is a part of **the articulated understandings, skills, and judgments that serve as the foundation of knowledge (the "body") for professionals in agricultural and extension education**. Levels of agreement will be recorded using the scale: 1 = **STRONGLY DISAGREE**, 2 = **DISAGREE**, 3 = **SOMEWHAT DISAGREE**, 4 = **SOMEWHAT AGREE**, 5 = **AGREE**, and 6 = **STRONGLY AGREE**.

Please rate these statements, indicating your agreement/disagreement for each in describing the **knowledge base** for the profession of Agricultural and Extension Education.

SCALE:

Strongly
Disagree

Strongly Agree

1 2 3 4 5 6

Statements:

Believes that technology enriches student experiences.

1 2 3 4 5 6

Acknowledges the importance of a broad understanding of cultural and global diversity for teachers and students.

1 2 3 4 5 6

Round II, Continued

Bases the program on sound science, connected to basic sciences.

1 2 3 4 5 6

Dedicated, honest, of high character, hardworking, and trustworthy.

1 2 3 4 5 6

Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.

1 2 3 4 5 6

Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.

1 2 3 4 5 6

Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.

1 2 3 4 5 6

Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.

1 2 3 4 5 6

Focuses on knowing as well as applying knowledge to real-life situations.

1 2 3 4 5 6

Applies appropriate communication skills - written and oral.

1 2 3 4 5 6

Be flexible and willing to stay current in their specific knowledge base.

1 2 3 4 5 6

Round II, Continued

Aspires for higher order learning.

1 2 3 4 5 6

Accesses technologies to support quality instruction.

1 2 3 4 5 6

Broad base agricultural knowledge that is communicated to learners.

1 2 3 4 5 6

Collaborates with colleagues, other professionals, and other constituents to assess needs, problem-solve, brainstorm, and research new ideas to improve education for all students.

1 2 3 4 5 6

Acts as an advocate for students in the larger community as well as in school.

1 2 3 4 5 6

Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.

1 2 3 4 5 6

Collaborates with community businesses to provide instructional experiences designed to increase student awareness and to link students with career opportunities within the local community.

1 2 3 4 5 6

Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.

1 2 3 4 5 6

Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.

1 2 3 4 5 6

Round II, Continued

Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.

1 2 3 4 5 6

Believes professional responsibilities extend beyond the classroom.

1 2 3 4 5 6

Disseminates results of learning from practice and research.

1 2 3 4 5 6

Engages in formative and summative program evaluation with others.

1 2 3 4 5 6

Applies critical thinking skills to solve educational and agricultural problems.

1 2 3 4 5 6

Employs communications skills in large and small group settings and with individuals.

1 2 3 4 5 6

Integrates technology into teaching and learning.

1 2 3 4 5 6

Establishes respectful and productive relationships and partnerships to support students' learning and well-being.

1 2 3 4 5 6

Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.

1 2 3 4 5 6

Effectively manages the classroom to optimize learning.

1 2 3 4 5 6

Round II, Continued

Knows how to apply inductive and deductive reasoning in the critical thinking process.

1 2 3 4 5 6

Invites student, parent, and community input into the development of the curriculum.

1 2 3 4 5 6

Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.

1 2 3 4 5 6

Is attentive to indications of challenges or difficulties that may affect healthy development.

1 2 3 4 5 6

Knows the goals, limitations, and appropriateness of various methods of instruction.

1 2 3 4 5 6

Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.

1 2 3 4 5 6

Has experienced professional preparation of instructors.

1 2 3 4 5 6

Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.

1 2 3 4 5 6

Formulates research studies, completes a research project, reports results and applies those results to actual instructional settings.

1 2 3 4 5 6

Round II, Continued

Knows how to integrate subject disciplines in order to demonstrate the connections that exist between knowledge and life.

1 2 3 4 5 6

Incorporates authentic strategies for evaluation of students and curricula.

1 2 3 4 5 6

Leadership and personal skills development.

1 2 3 4 5 6

Is committed to working with families and other adults to promote healthy development of adolescents and young adults.

1 2 3 4 5 6

Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.

1 2 3 4 5 6

Involves all areas related to the dissemination of information to the general public in specific subject matters as defined by the USDA.

1 2 3 4 5 6

Knows supplementary resources available to promote effective instruction.

1 2 3 4 5 6

Integrates career education preparation experiences into learning activities that provide students with necessary workplace skills and awareness.

1 2 3 4 5 6

Maintains effective classroom management that enables students to become self-directed.

1 2 3 4 5 6

Round II, Continued

Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).

1 2 3 4 5 6

Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.

1 2 3 4 5 6

Leadership training transcends all career activities and responsibilities.

1 2 3 4 5 6

Manages time and sets priorities.

1 2 3 4 5 6

Understands and uses formal and informal assessment strategies to evaluate learning and impact. 1 2 3 4 5 6

Recognizes the skills necessary to assure equity.

1 2 3 4 5 6

Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.

1 2 3 4 5 6

Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.

1 2 3 4 5 6

Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.

1 2 3 4 5 6

Round II, Continued

Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.

1 2 3 4 5 6

Motivates learners.

1 2 3 4 5 6

Understands the diversity of family structures among adolescents and young adults and the implications of that diversity.

1 2 3 4 5 6

Provides experiences that increase the learner's knowledge of global issues.

1 2 3 4 5 6

Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.

1 2 3 4 5 6

Recognizes and acknowledges the broad spectrum of a student's experience within the culture of the community.

1 2 3 4 5 6

Understands components, principles, and theories of adolescent and young adult development.

1 2 3 4 5 6

Takes into account unique family needs that affect student learning.

1 2 3 4 5 6

Provides students with interdisciplinary and integrated learning experiences involving several curricular areas to link knowledge, skills, and methods of inquiry to real life applications.

1 2 3 4 5 6

Round II, Continued

Uses a leadership style that is flexible to a variety of situations.

1 2 3 4 5 6

Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.

1 2 3 4 5 6

Participates in continual professional development in the teaching/learning processes.

1 2 3 4 5 6

Understands the educational impact of exponential advances in technology.

1 2 3 4 5 6

Teams with colleagues to discuss students' needs and to collaborate in developing programs that address the developmental needs of adolescents and young adults.

1 2 3 4 5 6

Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.

1 2 3 4 5 6

Understands his/her responsibility to the community.

1 2 3 4 5 6

Plans instruction to support the development of individual student identity and goals.

1 2 3 4 5 6

Understands the high school environment as an organization within the larger community context.

1 2 3 4 5 6

Round II, Continued

Thinks creatively and critically.

1 2 3 4 5 6

Respects and appreciates the range of individual developmental differences.

1 2 3 4 5 6

Understands the importance of the school in fostering democratic principles and good citizenship.

1 2 3 4 5 6

Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors)

1 2 3 4 5 6

Uses appropriate analytical techniques to research agricultural and educational problems.

1 2 3 4 5 6

The underlying theoretical base for extension is grounded in reflective practice.

1 2 3 4 5 6

Understands the importance of diversity in the school population and in the curriculum, instruction, and assessment of all students.

1 2 3 4 5 6

Values the importance of co-curricular and extra-curricular activities as an essential part of the high school mission.

1 2 3 4 5 6

Works with resource persons and community groups to promote student learning and citizenship.

1 2 3 4 5 6

Round II, Continued

Uses effective communications to promote active learning, collaboration, and interaction.

1 2 3 4 5 6

Values the opportunity to work with a diverse population.

1 2 3 4 5 6

Understands the range of developmental characteristics of adolescents including interpersonal, cultural, and societal contexts.

1 2 3 4 5 6

Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.

1 2 3 4 5 6

Uses knowledge of students' developmental characteristics to facilitate student learning.

1 2 3 4 5 6

While sharing a common level of understanding, agricultural education and extension education have distinct basic building blocks distinguished by formal and non formal education.

1 2 3 4 5 6

Utilizes school and community resources to support the healthy intellectual, social, and personal development of adolescents and young adults.

1 2 3 4 5 6

Youth development is provided by extension education through 4-H.

1 2 3 4 5 6

Values the right of students to develop their own identities and to pursue their own personal goals.

1 2 3 4 5 6

Round II, Continued

Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.

1 2 3 4 5 6

Solves problems.

1 2 3 4 5 6

Other:

1 2 3 4 5 6

Other:

1 2 3 4 5 6

APPENDIX D
ROUND III INSTRUMENT

**AGRICULTURAL AND EXTENSION EDUCATION
KNOWLEDGE BASE
ROUND III**

In the second round of this survey, you and colleagues rated your level of agreement with statements describing the knowledge base of Agricultural and Extension Education. A total of **27** statements were dropped from the second round because fewer than two-thirds of the respondents agreed or strongly agreed with those statements. Two additional statements were identified in round two and have been added to this third round.

Instructions: Each of the following statements may be a part of **the articulated understandings, skills, and judgments that serve as the foundation (the "body") of knowledge for professionals in agricultural and extension education.**

Located next to each scale item (in blue) is the number of responses for each level of agreement from round two. Now, given the range of responses from round two, you should again record YOUR level of agreement with each statement using the scale: 1 = **STRONGLY DISAGREE**, 2 = **DISAGREE**, 3 = **SOMEWHAT DISAGREE**, 4 = **SOMEWHAT AGREE**, 5 = **AGREE**, and 6 = **STRONGLY AGREE**.

Remember that you are rating your agreement/disagreement with each statement in terms of its potential for describing the **knowledge base** for the profession of Agricultural and Extension Education. If you would like, please comment on your rating for any statement using the textbox following that statement.

Strongly Disagree						Strongly Agree
1	2	3	4	5		6

STATEMENT:

Bases the program on sound science, connected to basic sciences.

1 2 3 4 (4) 5 (5) 6 (5)

Dedicated, honest, of high character, hardworking, and trustworthy.

1 2 3 4 5 (7) 6 (7)

Round III Continued

Adapts curriculum, instruction, resources, and assessment to compensate for learning differences among adolescents and young adults.

1 2 3(1) 4(2) 5 (5) 6 (6)

Believes in a theoretical base that is primarily learning by doing, experiential learning, and Maslow's hierarchy of needs.

1 2 3 4 (3) 5 (5) 6 (6)

Knows and uses biological, physical, and applied sciences related to agriculture, food, fiber, and natural resources systems.

1 2 3 4(1) 5 (6) 6 (7)

Appreciates that curriculum must be renewed continually because of the dynamic nature of knowledge.

1 2 3 4(1) 5 (8) 6 (5)

Focuses on knowing as well as applying knowledge to real-life situations.

1 2 3 4(1) 5 (7) 6 (6)

Applies appropriate communication skills - written and oral.

1 2 3 4(1) 5 (5) 6 (8)

Be flexible and willing to stay current in their specific knowledge base.

1 2 3 4 5 (9) 6 (5)

Aspires for higher order learning.

1 2 3(1) 4(3) 5 (5) 6 (5)

Broad base agricultural knowledge that is communicated to learners.

1 2 3(2) 4(1) 5 (7) 6 (4)

Round III Continued

Acts as an advocate for the students in the larger community as well as the school.

1 2(1) 3 4(2) 5 (7) 6 (4)

Believes in active collaboration with community agencies and other resources within the school and community to support the needs of students.

1 2(1) 3 4(3) 5 (5) 6 (5)

Demonstrates professional dispositions including appropriate ethical behavior, strong work ethic, and positive interactions with others.

1 2 3 4(1) 5 (5) 6 (8)

Is committed to establishing a caring environment that supports the healthy development of adolescents and young adults.

1 2(1) 3 4(2) 5 (4) 6 (6)

Acquires basic skills and content knowledge as prerequisites to becoming a successful teacher or extension professional.

1 2 3 4(1) 5 (5) 6 (8)

Believes professional responsibilities extend beyond the classroom.

1 2 3 4 5 (8) 6 (6)

Disseminates results of learning from practice and research.

1 2 3 4(1) 5 (7) 6 (6)

Engages in formative and summative program evaluation with others.

1 2(2) 3 4(1) 5 (6) 6 (5)

Applies critical thinking skills to solve educational and agricultural problems.

1 2 3(1) 4(2) 5 (2) 6 (8)

Round III Continued

Employs communications skills in large and small group settings and with individuals.

1 2(1) 3 4(2) 5 (5) 6 (6)

Integrates technology into teaching and learning.

1 2 3 4(4) 5 (7) 6 (3)

Establishes respectful and productive relationships and partnerships to support students' learning and well-being.

1 2 3(1) 4(3) 5 (4) 6 (6)

Is committed to the creation of an environment that demands the development of critical thinking skills to prepare the student for life.

1 2 3 4(3) 5 (7) 6 (4)

Effectively manages the classroom to optimize learning.

1 2 3 4 5 (5) 6 (9)

Knows how to apply inductive and deductive reasoning in the critical thinking process.

1 2(1) 3 4(3) 5 (7) 6 (3)

Invites student, parent, and community input into the development of the curriculum.

1 2(1) 3(2) 4(1) 5 (9) 6 (1)

Employs a variety of teaching strategies designed to meet the diverse learning styles and needs of students.

1 2 3(1) 4(1) 5 (6) 6 (6)

Knows the goals, limitations, and appropriateness of various methods of instruction.

1 2 3(1) 4(1) 5 (6) 6 (6)

Round III Continued

Is committed to the development of thoughtful, ethical, democratic citizens within the context of global interdependence.

1 2(1) 3 4(3) 5 (4) 6 (6)

Has experienced professional preparation of instructors.

1 2 3 4(2) 5 (4) 6 (8)

Encourages and supports student and teacher participation in co-curricular and extra-curricular activities.

1 2 3(1) 4(1) 5 (8) 6 (4)

Incorporates authentic strategies for evaluation of students and curricula.

1 2 3(2) 4(1) 5 (7) 6 (4)

Leadership and personal skills development.

1 2 3 4(3) 5 (7) 6 (4)

Links agricultural science with the biological and related science preparatory programs, leading to dual certification and linkage with colleagues in the natural and biological sciences.

1 2 3(2) 4(2) 5 (6) 6 (4)

Involves all areas related to the dissemination of information to the general public in specific subject matters as defined by the USDA.

1 2 3 4(6) 5 (8) 6

Maintains effective classroom management that enables students to become self-directed.

1 2 3 4(1) 5 (8) 6 (5)

Is positive, enthusiastic, and committed to students in their developmental period.

1 2 3 4(1) 5 (6) 6 (7)

Round III Continued

Knows learning styles (e.g., Kinesthetic, Problem-based, Experiential, Collaborative).

1 2 3(3) 4(1) 5 (5) 6 (5)

Involves all areas of the teaching/learning process that address subject matter of agriculture, food, fiber, and natural resources.

1 2 3(1) 4(2) 5 (6) 6 (5)

Leadership training transcends all career activities and responsibilities.

1 2 3(1) 4(3) 5 (6) 6 (4)

Manages time and sets priorities.

1 2 3(1) 4(1) 5 (5) 6 (7)

Understands and uses formal and informal assessment strategies to evaluate learning and impact.

1 2 3 4(2) 5 (9) 6 (3)

Recognizes the skills necessary to assure equity.

1 2 3(1) 4(3) 5 (8) 6 (2)

Possesses a broad and deep knowledge of the content area and standards for which the teacher of adolescents and young adults is responsible.

1 2 3 4(2) 5 (7) 6 (5)

Thoroughly understands and applies pedagogical practices to teaching in formal and non-formal settings.

1 2 3(1) 4(2) 5 (4) 6 (7)

Understands that the high school learning community expects demonstrated academic achievement for every student in accordance with measurable standards.

1 2 3(1) 4(1) 5 (6) 6 (6)

Round III Continued

Seeks out, develops, and continually refines practices that address the individual needs of adolescent and young adult learners.

1 2 3(1) 4(1) 5 (7) 6 (5)

Motivates learners.

1(1) 2 3 4 5 (6) 6 (7)

Models positive attitudes and appropriate behaviors for adolescents and young adults in a democratic society.

1 2 3 4 (3) 5 (6) 6 (5)

Uses a leadership style that is flexible to a variety of situations.

1 2 3(1) 4(2) 5 (7) 6 (4)

Teaches decision-making and problem-solving models and provides opportunities to use them in personal, career, and educational issues.

1 2 3 4(2) 5 (7) 6 (5)

Teams with colleagues to discuss students' needs and to collaborate in developing programs that address the developmental needs of adolescents and young adults.

1 2(1) 3(1) 4(2) 5 (8) 6 (2)

Provides learning experiences that integrate life applications to present conditions as well as future education and the work place.

1 2 3(2) 4(1) 5 (7) 6 (4)

Understands his/her responsibility to the community.

1 2 3(2) 4(1) 5 (7) 6 (4)

Plans instruction to support the development of individual student identity and goals.

1 2 3(1) 4(2) 5 (5) 6 (6)

Round III Continued

Understands the high school environment as an organization within the larger community context.

1 2 3(1) 4(3) 5 (6) 6 (4)

Thinks creatively and critically.

1 2 3 4(1) 5 (7) 6 (6)

Understands the importance of the school in fostering democratic principles and good citizenship.

1 2 3(1) 4(2) 5 (5) 6 (5)

Recognizes that teachers, agents and others can learn to teach and improve their teaching skills (i.e., professional preparation of instructors).

1 2 3(1) 4(1) 5 (3) 6 (9)

Uses effective communications to promote active learning, collaboration, and interaction.

1 2 3 4(4) 5 (5) 6 (5)

Values and appreciates the importance of all staff members, constituents, and students in the collaboration process.

1 2 3(3) 4 5 (7) 6 (4)

Uses knowledge of students' developmental characteristics to facilitate student learning.

1 2 3(1) 4(2) 5 (7) 6 (4)

While sharing a common level of understanding, agricultural education and extension education have distinct basic building blocks distinguished by formal and non formal education.

1 2 3 4(4) 5 (3) 6 (7)

Youth development is provided by extension education through 4-H.

1 2 3(2) 4(1) 5 (5) 6 (6)

Round III Continued

Values the right of students to develop their own identities and to pursue their own personal goals.

1 2 3(1) 4(2) 5 (5) 6 (6)

Uses learner-centered instruction, focused on needs of learner rather than actions of the instructor.

1 2 3 4(1) 5 (7) 6 (6)

Understands the range of developmental characteristics of adolescents including interpersonal, cultural, and societal contexts.

1 2 3 4 5 6

Motivation is intrinsic. Teacher creates an environment which allows a student to motivate themselves to learn.

1 2 3 4 5 6

VITA

Gregory Aaron Cummings graduated from Utah State University in May 2001 with a Bachelor of Science in agricultural education. Gregory completed his student teaching at West Side High School in Dayton, Idaho. He then went on to earn a Master of Science in agricultural education at Texas A&M in May 2005. While at Texas A&M University he held a graduate teaching assistantship. In conjunction with Dr. Gary Wingenbach, Gregory published an article in the *Journal of Extension Systems*. He taught science for two years at North Zulch High School in Texas. He now teaches Agricultural Science and is the Lead Agricultural Science Teacher at Clear Creek High School in League City, Texas and resides at 754 Voyager Drive in Houston, Texas.