Competencies and Traits of Successful Agricultural Science Teachers

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ABSTRACT

The purpose of this mixed-methods study was to identify the required competencies and traits of successful agricultural science teachers. Data was collected from focus groups of agricultural science teachers and a content analysis of existing research. Results identified 47 unique traits or competencies that were divided into the categories of Instruction; Student Organization; Supervised Experience; Program Planning and Management; School and Community Relations; Personal Traits; and Professionalism. One newly discovered competency, "working with diverse groups," transcended categories. A model depicting the traits and competencies was developed.

INTRODUCTION

Today's school climate is saturated with accountability mandates at every level. For example, current federal legislation requires that by the end of the 2005-2006 academic school year all teachers are "Highly Qualified" (No Child Left Behind, 2002). The law operationalized "Highly Qualified" using three criteria: full certification, a bachelor's degree, and competence in subject knowledge and teaching. Full certification and having a bachelor's degree are easily determined. Competency in subject matter and pedagogy is more subjective, and thus more difficult to measure.

The importance of understanding competencies required for a career is authenticated by the Trait and Factor theory of career selection (Parsons, 1909). According to this theory, three factors contribute to a person's success and happiness in a career: 1) the person's traits, which include aptitudes, abilities, interests, ambitions, resources, and limitations; 2) knowledge of the factors or competencies required for a given career; and 3) the closeness in match between the two. Thus, understanding the competencies and traits requisite of a successful agricultural science teacher is critical.

From a programmatic perspective, the American Association for Agricultural Education (AAAE) (2001) developed the *National Standards for Teacher Education* to describe what a teacher education program in agricultural science education should look like. The standards provide an input-side framework for assessing the quality of a preservice agricultural science teacher program. For example, Standard 2 indicates that a preservice agricultural science program should consist of a balanced curriculum that includes general education, technical agriculture content, and pedagogy professional skills. The document goes further to indicate topics in each respective area that students should receive instruction. However, the standards stop short of indicating the desirable outcomes of the program. Specifically, what competencies and traits should graduates possess?

Much research exists on skills, competencies and traits of effective teachers, in the general sense. Most notably is the work of Rosenshine and Furst (1971), who synthesized other research and identified five fundamental characteristics of effective teachers: clarity, variability, enthusiasm, student opportunity to learn material, and task oriented/business like behavior. According to Suydam (1983), effective teachers also offer encouragement, engage students, minimize distractions and wasted time, establish and follow rules, monitor behavior, give clear directions, and move through the classroom. Richardson and Arundell (1989) added that effective teachers use a variety of examples, effectively plan for instruction, and are knowledgeable of both subject matter and pedagogy. Young (1990) further added that effective teachers plan and execute interesting lessons using a variety of methods, monitor student learning and behavior, and maintain rapport with students.

The above-mentioned characteristics begin to establish the competencies and traits needed by agricultural science teachers, particularly related to those in the formal setting of the classroom. However, teaching agricultural science extends beyond the classroom (Phipps & Osborne, 1988). Agricultural science teachers are expected to facilitate student projects, advise student organizations, administer adult groups, as well as plan and operate the agricultural science program. What competencies and traits are needed to accomplish these tasks?

Identification of a list of competencies and traits can serve as a guide for the desired outcomes of preservice agricultural science teacher programs. Additionally, if specific competencies and traits are innate, they could be used to identify individuals for recruitment into preservice agricultural science programs. As a result, graduates of preservice programs will possess competencies and traits that match those requisite of an agricultural science teacher, thus increasing their happiness and success as agricultural science teachers.

Two previous studies have explored the competencies or traits of effective agriculture science teachers. Roberts and Dyer (2004) utilized a Delphi approach to identify characteristics common across teachers that were identified as being effective in their field. This study used an expert panel of agricultural science teachers, administrators, state agricultural education staff, and university teacher educators in Florida. Many years earlier, Shippy (1981) identified 246 competencies needed by beginning teachers of agricultural science teachers. Using a list of 250 potential competencies developed from a thorough review of the literature, Shippy surveyed beginning and experienced agricultural science teachers, along with local agricultural education supervisors in Delaware. These two studies provided a basis for identifying the competencies of successful agricultural science teachers and were used as data sources for the current study. Their respective results are discussed in greater detail in the findings section of this manuscript.

PURPOSE AND OBJECTIVES

The purpose of this mixed-methods study was to identify the required competencies of successful agricultural science teachers. Three objectives guided this inquiry: 1) Identify competencies and traits of successful agricultural science teachers from the perspective of both preservice and inservice teachers; 2) Identify competencies and traits reported in the literature; and 3) Synthesize the results from Objective 1 and Objective 2 into a working model.

METHODS

The purpose of this study was accomplished using multiple inquiry methods. Objective one was met using a focus-group approach with preservice and inservice teachers, objective two was met using content analysis, and objective three was met using a constant-comparative method. The above was conducted by a research team that included two faculty members directly involved in preservice teacher education and two faculty members in the same department, but not directly involved in teacher preparation.

Multiple focus groups were conducted with preservice and inservice teachers to achieve objective one. Focus group interviewing is a guided discussion about a particular topic of interest or relevance to the group and the researchers (Edmunds, 1999). Focus group sessions are moderated and should be kept to small groups in order to capture collective thoughts, opinions, and feelings of the respondents (Berg, 2001). Research team members involved in preservice teacher education identified current (preservice teachers) and former students (inservice teachers who graduated within the last five years) to participate in the focus groups. The other research team members facilitated the focus groups sessions to eliminate bias or coercion of participants. Four focus groups were held, two for preservice teachers and two for inservice teachers ($n = 40$). One additional inservice teacher who was unable to attend either session provided data via a telephone interview. Informed consent was obtained by all participants.

The focus groups with preservice teachers were conducted during a regularly scheduled session of a required agricultural education class and lasted approximately one hour. Open-ended questions presented through a PowerPoint presentation were used to guide group discussion. One research team member served as the facilitator, while the other took field notes. Each session was audio recorded and transcribed to ensure accuracy of the data.

Given the geographic distance between participants, the focus group sessions held with inservice teachers were conducted using an online conferencing system that allowed for audio and textual communication between participants and researchers. The same open-ended questions delivered with PowerPoint were used to guide the discussion. Data was collected using field notes and audio recordings of the focus groups.

Data collected from the focus groups and interview was analyzed using the constant comparative method (Lincoln & Guba, 1985). Researchers analyzed transcripts of all four focus group sessions and the one phone interview to determine trends in the data.

Each unit (idea) was initially listed, without placement into categories. Tacit knowledge was employed in making initial judgments for categorization. Colored markers were used to identify themes so that the data could remain in context and provide a visual indication of emerging categories. The researchers summarized the findings into comparison tables to provide a snapshot of both preservice and inservice teacher perspectives framed by the focus group/interview protocol. A peer debriefing was held with the entire research team to review and provide feedback on findings. Debriefing and analysis allowed the research team to further identify themes.

The second objective was accomplished using content analysis. Patton (2002, p. 453) posited that "content analysis is used to refer to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings." This was operationalized in the current study by examining previously published agricultural education research that addressed traits or competencies of agricultural science teachers. The *Journal of Agricultural Education* (previously published as the *Journal of the American Association of Teacher Educators in Agriculture*) and the *Journal of Career and Technical Education* (formerly the *Journal of Vocational and Technical Education*) are widely accepted as the premier outlets for agricultural education research and were thus chosen as the data source for conducting the content analysis.

The final objective of this study was achieved using a constant-comparative method (Lincoln & Guba, 1985). Traits and competencies identified from the focus-groups (objective one) and from the content analysis (objective two) were placed into a category with similar items or into a new category if it was sufficiently different to not fit into an existing category. These categories were used to create a visual representation of the competencies and traits required of successful agricultural science teachers.

FINDINGS

The findings of this study pertaining to all three objectives are presented together to create a coherent discussion about the competencies and traits of successful agricultural science teachers. An examination of the *Journal of Agricultural Education* and the *Journal of Career and Technical Education* revealed two articles that addressed traits and competencies of agricultural science teachers, one written by Shippy (1981) and one written by Roberts and Dyer (2004). Shippy's results were from agricultural science teachers in Delaware. Roberts and Dyer's results were from agricultural science teachers and state staff in Florida. The current data were from preservice and inservice agricultural science teachers in [state].

Shippy (1981) identified "Program Planning, Development, and Evaluation" as a separate category from "Management." Roberts and Dyer (2004) grouped these items together into one area identified as "Program Planning and Management." Data collected from this study supported the importance of this category. Respondents identified "Visioning/Strategic Planning (Program Improvement)" as an important area. While the wording is different, the researchers feel the meaning behind the words is equivalent to those of previous studies. One inservice teacher responded, "The program is growing and sometimes you can't do all the changes you want in one year—it takes time." Another teacher reported that they had built their program from 28 to over 200 students by using these competencies. Therefore, the ability to plan for the future, develop effective programs, and evaluate the effectiveness of the program is an important aspect of the profession. These skills are necessary for continuous improvement of school-based agriculture programs. A summary of findings can be seen in Table 1.

The area of "Instruction" as identified by Roberts and Dyer (2004) was placed in association with five categories identified by Shippy (1981) (Planning of Instruction; Execution of Instruction; Evaluation of Instruction; Guidance; and Management). Analysis of the data revealed that while this category maintains a strong importance – the data should be sub-divided into three areas including knowledge, skills, and attributes as they relate to instruction. The researchers believe that separation of instruction into these areas provides for a clearer picture of the competencies required of an effective agriculture science teacher. A summary of findings related to instruction can be seen in Table 2.

Table 1

Program Planning and Management Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study

Program Planning, Development, and Evaluation	Program Planning/ Management	Program Planning and Management
• Develop and write general objectives for the vocational agriculture program offerings	• Effectively manages, maintains, and improves laboratories	• Visioning/strategic planning (Program improvement)
• Identify competencies needed for entry into an agriculture operation	• Effectively manages, operates and evaluates the agriculture program on a continuous basis	
• Participate in the identification of the school's vocational agriculture program purposes and goals	• Effectively manages finances, grants, and special projects	
Management		
• Provide approved safety apparel and devices for vocational agriculture assigned to hazardous equipment		

Table 2

Instructional Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study

Planning of Instruction

- Plan the content of a lesson
- Determine student needs and interests
- Plan the summary of a lesson

Execution of Instruction

- Give an assignment in a clear and concise manner
- Reinforce learning
- Direct students in applying problem-solving techniques

Evaluation of Instruction

- Formulate a system of grading consistent with school policy
- Establish criteria for stud performance
- Determine students' grades based on related instruction and laboratory or on-the-job experience

Guidance

- Demonstrate a regard for and an interest in students as individuals
- Develop constructive working relationships among students
- Demonstrate concern for the student

Management

- Uphold standards of student behavior
- Carry out approved disciplinary action when warranted

Instruction

- Effectively plans for instruction
- Effectively evaluates students
- Communicates well with others
- Effectively recognizes achievements
- Effectively motivates students
- Has a love of agriculture
- Effectively manages student behavior; maintains discipline
- Encourages, counsels, and advises students
- Effectively determines students needs
- Uses a variety of teaching techniques
- Incorporates science and other areas of the school curriculum into the agriculture program
- Has excellent knowledge of the subject matter
- Is innovative; uses technology; adapts well to change
- Is capable of solving problems and multi-tasking
- Is knowledgeable of teaching and learning theory

Instructional Knowledge

- Content specialization
- Broad knowledge of agriculture

Instructional Skills

- Instructional/teaching skills
- Classroom management
- Ability to motivate and persuade others
- Facilitation skills

Instructional Attributes

- Recognize individual differences
- Multi-tasking skills
- Decisiveness/decision-making skills
- Conflict resolution
- Mentoring skills

Analysis of the data related to the knowledge area of instruction reveal that respondents believe that effective teachers should be well-rounded with both a content specialization and a broad knowledge about the field of agriculture. Respondents expressed specific needs related to content specialization, mentioning animal science, horticulture, agricultural mechanics, leadership education, and knowledge of agriculture careers as critical areas. Leadership education was mentioned in both the context of teaching leadership content and modeling leadership behavior. This might be expected given the recent focus on this topic within the agriculture science field. The area of agricultural careers was expressed as being a critical component primarily due to the "urbanization" and more broadly defined aspects of agriculture being taught in the schools today. One preservice teacher mentioned that teachers should "know the diverse aspects of agriculture, not just farming."

The skills area of instruction is related to teaching methods and delivery. This area includes instructional/teaching skills, classroom management, the ability to motivate and persuade learners, and facilitation skills. Respondents felt strongly that these skills would cause a teacher to be successful or unsuccessful. It was noted that effective teachers use a variety of in-class instructional techniques and must have the "ability to involve everyone." "The good ones motivate and persuade students and dedicate time" and have the "ability to use different teaching materials well." "The most important part is the education of the students in the classroom – interesting lessons and a willingness to put the time in— [it is a] very time consuming job."

The attribute area of teaching effectiveness relates to the teacher's attitude or abilities that can impact the instructional environment. Items such as recognizing individual differences, multi-tasking, decision making, conflict resolution and mentoring skills were identified by the researchers as being associated with the category. The category "guidance," identified by Shippy (1981) complements the concept of mentoring directly and has been grouped with instruction as a result of Roberts and Dyer (2004). Specifically, respondents mentioned that a teacher must be a planner because there are so many things going on and have the ability to "switch to different content for different classes using different approaches with different students." It was noted that a teacher should "realize that you're a teacher AND a mentor."

The two areas, "student vocational organization" and "supervised occupational experience" (Shippy, 1981) and FFA and SAE (Roberts & Dyer, 2004) were supported in this study. The terms "working with teams" and "record book skills" and "experience showing/ working with animals" were used by respondents to identify this area. There was recognition that these activities take a considerable amount of time and commitment outside of the classroom and a belief that the most effective agriculture science teachers were involved in FFA when they were in high school. A summary of findings related to working with student organizations and SAE can be seen in Table 3 and Table 4, respectively.

Table 3

Student Organization Facilitation Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study
Student Vocational Org.	*FFA*	*Student Organization*
• Provide advice for student entries in state and national FFA contests	• Has a sound knowledge of FFA, actively advises the FFA chapter, and effectively prepares students for CDEs and other FFA activities	• Working with teams
• Conduct an organizational meeting for the local FFA chapter		
• Acquaint prospective members & their parents with the purposes, activities, and values of the FFA		

Table 4

Supervised Experience Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study
Supervised Occupational Experience	*Supervised Agricultural Experience*	*Supervised Experience*
• Make instructional visits to students concerning their projects	• Has a sound SAE knowledge, actively supervises, and encourages	

	SAE projects	
• Supervise students in identifying and planning appropriate projects		• Record book skills
• Select and supervise student use of an appropriate record system		• Experience showing/working with animals

The researchers believe that the area identified by Shippy (1981) as "school-community relations" can be directly related to the categories of "community relations" and "marketing" which were identified by Roberts and Dyer (2004). Respondents supported the concept of community involvement and expanded that involvement to include educating and communicating with others. Respondents felt that effective teachers should "be active with community development and outreach" and need to be able to "educate others about what we do." A summary of findings related to school and community relations can be found in Table 5.

Professionalism was supported as an important category in the current study. Both Shippy (1981) and Roberts and Dyer (2004) identify "professional role and development" and "professionalism / professional growth" as characteristics of effective teachers. Respondents expanded upon this area by identifying lifelong learning and a commitment/willingness to work after hours as important traits of an effective teacher. One preservice student indicated that effective teachers "stay current by attending professional development activities, including learning new technologies." An inservice teacher responded, "You can't know everything. You learn as much as you can in college and get the most out of your student teaching, but you need to be a continuous learner and able to learn things on your own." Respondents also indicated that a "willingness to travel" was a critical component of effective teachers. A summary of findings related to professionalism can be seen in Table 6.

Table 5

School and Community Relations Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study
School-Community Relations	*Community Relations*	*School and Community Relations*
• Maintain working relationships with the school administration and faculty	• Works well with parents	• Community involvement
• Maintain working relationships with the school supporting staff	• Establishes and maintains good community relations	• Educating and communicating with others
• Maintain good relations with other schools	• Works well with alumni and advisory groups	
	Marketing	
	• Works well with other teachers and administrators in his/her school	
	• Maintains an effective public relations program	
	• Effectively recruits new students	

Table 6

Professionalism Competencies Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study
Professional Role and Development	*Professionalism/Professional Growth*	*Professionalism*
• Maintain ethical standards expected of a professional educator	• Puts in extra hours; is dedicated to doing a good job	
• Keep up-to-date through reading professional literature	• Displays a professional image	• Lifelong learning
• Acquire new occupational skills and information needed to keep pace with technological advancement in vocational agriculture	• Enjoys teaching and exhibits a positive attitude towards the teaching profession	• Commitment/willingness to work after hours
	• Improves professionally by seeking opportunities for continued learning	
	• Takes actions to prevent burnout and to re-energize himself/herself	

The area of "personal qualities" identified by Roberts and Dyer (2004), while not listed by Shippy (1981), were strongly supported by the current study. Respondents identified responsibility, internal motivation, creativity, enthusiasm, time management, patience, caring/understanding, planning/organizing skills, resourcefulness/flexibility, open-mindedness, and people skills as important traits of an effective teacher. One respondent indicated that an effective teacher must have "personal organization with a focus on getting things done." An effective teacher is "organized and always has a 'to-do' list." Some respondents mentioned that effective teachers enjoy what they are doing but others felt their high school teachers were extremely burned-out, thus providing a non-example role model. It can be summed up with these quotes: "It takes extreme commitment" and "expect the unexpected." A summary of findings relate to personal traits can be seen in Table 7.

Table 7

Personal Traits Required of Agricultural Science Teachers.

Shippy (1981)	Roberts & Dyer (2004)	Current Study
No Competencies Indicated	*Personal Qualities*	*Personal Traits*
	• Cares for students	• Caring/understanding
	• Is motivated	• Internal motivation
	• Is enthusiastic	• Enthusiasm
	• Is open-minded	• Open-mindedness
	• Is well organized; has excellent time management skills	• Planning/organizing skills
	• Is resourceful	• Time management
		• Resourceful

• Is self-confident	• Responsibility
• Has an understanding and supportive spouse/family	• Creativity
	• Patience
• Is honest, moral, and ethical	• People skills

A new competency discovered in the current study focused on the "ability to work with diverse groups." This concept does not directly relate to ethnic diversity but rather to diversity among students relating to interests, focus, and overall program objectives. Both inservice and preservice teachers mentioned this category with comments such as "the ability to tailor to each student" and "dealing with kids that don't know anything about Agriculture." One particular teacher was working in an affluent school district in an urban area and shared that many students entering their program have no previous knowledge of agriculture. Many inservice teachers noted that they have several special needs students in their classroom. "We aren't necessarily a dumping ground but we have a vast variety of academic levels in our classes." Another point relevant to this competency was that many student lack "passion" about agriculture and thus the teacher has to be able to "change from year to year depending on the students and school."

Based on the reported findings, a visual model was constructed to provide greater understanding of the competencies and traits required of successful agricultural science teachers. Given that seven categories were identified (Instruction; Student Organization; Supervised Experience; Program Planning and Management; School and Community Relations; Personal Traits; and Professionalism), a heptagon was chosen for the general shape of the model (see Figure 1). The newly identified competency, "working with diverse groups" was deemed by the research team to transcend and interact with all seven categories. Thus, this competency was placed in the center of the heptagon with double arrows extending to each category.
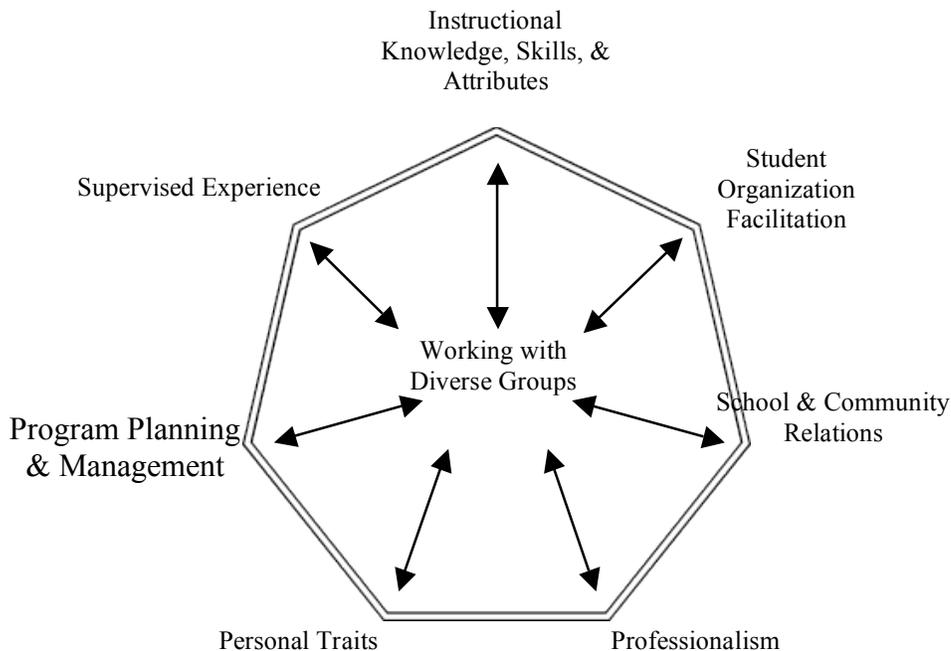

Figure 1. Model of Competencies and Traits of Successful Agricultural Science Teachers

SUMMARY AND CONCLUSIONS

Based on the findings of this study, it was concluded that successful agricultural science teachers cluster around 47 competencies or traits. Forty-six of the competencies or traits can be divided into the categories of Instruction; Student Organization; Supervised Experience; Program Planning and Management; School and Community Relations; Personal Traits; and Professionalism. "Working with diverse groups" is a competency that has importance to all seven categories and thus isn't easily assigned to any specific category.

Eleven competencies were identified in the instructional category. It was concluded that successful agricultural science teachers are competent in instructional knowledge, instructional skills, and instructional attributes. Instructional knowledge competencies included: 1) content specialization and 2) broad knowledge of agriculture. Instructional skills competencies include: 3) instructional/teaching skills; 4) classroom management; 5) ability to motivate and persuade others; and 6) facilitation skills. Instructional attribute competencies included: 7) recognize individual differences; 8) multi-tasking skills; 9) decisiveness/decision-making skills; 10) conflict resolution; and 11) mentoring skills.

Successful agricultural science teachers also are competent in working with student organizations. Specific competencies include: 1) preparing students for competitive events and other activities; 2) providing instruction about the student organization; and 3) actively advising the student organization. It was also concluded that successful agricultural science teachers must be capable of facilitating supervised experiences. Identified competencies include: 1) actively supervising student projects (planning and visiting); 2) assisting with student record keeping; and 3) prior personal experience in the types of projects that students undertake.

With respect to program planning and management, six competencies were identified. It was concluded that successful agricultural science teachers are competent in: 1) visioning/ strategic planning; 2) identifying competencies needed for entry into an agriculture operation; 3) providing approved safety apparel and devices for hazardous equipment; managing, maintaining, and improving laboratories; 4) managing, operating and evaluating the agriculture program on a continuous basis; and 6) managing finances, grants, and special projects.

Maintaining effective school and community relations is a proficiency requisite of successful agricultural science teachers. Identified competencies are: 1) establish and maintain good relations within the school; 2) establish and maintain good relations within the community; 3) establish and maintain good relations with parents and booster members; 4) recruitment of new members; and 5) educating and communicating with stakeholders about the program.

Thirteen personal traits or competencies are displayed by successful agricultural science teachers. These include: 1) caring; 2) motivated; 3) enthusiasm; 4) self-confidence; 5) balances time with family; 6) honest/moral/ethical; 7) open-minded; 8) organized; 9) resourceful; 10) responsible; 11) creative; 12) patient; and 13) intrapersonal skills.

Successful agricultural science teachers are also professionals. Specific identified competencies include: 1) exhibiting professional ethics; 2) continually improving professional knowledge (lifelong learning); 3) working beyond normal school day; 4) displaying a professional image; and 5) exhibiting a positive attitude about the profession.

RECOMMENDATIONS, DISUCSSION, AND IMPLICATIONS

The findings from the focus-group portion of the current study are remarkably similar to those of Shippy (1981) and Roberts and Dyer (2004), even though the studies varied in geographic location (Delaware, Florida, and [state]), research design (survey, Delphi, and focus group), and research sample (beginning teachers, established "experts," and preservice/ inservice teachers). This triangulation of the findings supports the premise that the competencies, and particularly categories of competencies, requisite of successful agricultural science teachers are somewhat stable, at least over the quarter century that this research spans.

Of great importance, the newly identified competency related to working with diverse groups goes beyond the earlier research and likely indicates that agricultural science programs are beginning to reflect the broader, diverse population of the United States. However, further research is needed to investigate this phenomenon. [State] is a state with much diversity; do agricultural science teachers in other states also need competence in working with diverse groups? How is competence in working with diverse groups operationalized? How are preservice agricultural science education programs preparing graduates to work with diverse groups?

The major recommendation stemming from the conclusions drawn in this study is that these 47 traits and competencies should provide a benchmark preservice agricultural science education programs and inservice teachers. Such an suggestion raises more questions: Do graduates possess the traits and competencies? If not, can they be developed as beginning teachers mature? What courses or activities are best at developing the traits and competencies in preservice teachers? What activities should inservice teachers undertake to develop and maintain these competencies? To what extent are preservice education programs encompassing the traits and competencies? Would examining "successful" agricultural science teachers in multiple states validate the traits and competencies? Are the "personal traits" identified attainable, as Roberts and Dyer (2004) suggest, or should they be present in individuals prior to admission?

REFERENCES

American Association for Agricultural Education. (2001). National standards for teacher education in agriculture. Retrieved June 27, 2005, from: http://aaae.okstate.edu/Reports/ncatestds.pdf.

Berg, B. L. (2001). *Qualitative research methods for the social sciences*. Needham Heights, MA: Allyn & Bacon.

Edmunds, H. (1999). *The focus group research handbook.* Thousand Oak, CA: Sage.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

No Child Left Behind Act of 2001, Pub. L. No. 107-110, 115 Stat. 1425 (2002).

Parsons, F. (1909). *Choosing a vocation.* Garrett Park, MD: Garrett Park Press.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

Phipps, L. J., & Osborne, E. W. (1988). *Handbook on agricultural education in public schools* (5th ed.). Danville, IL: The Interstate Printers and Publishers, Inc.

Richardson, A. G., & Arundell, A. (1989). *Characteristics of the effective teacher as perceived by pupils and teachers: A Caribbean case study*. (ERIC Document Reproduction Service No. ED 311 013).

Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education*, *45*(4), 82-95.

Rosenshine, B., & Furst, N. (1971). Research on teacher performance criteria. In B.O. Smith (Ed.), *Research in Teacher Education – A Symposium* (pp.37-72). Englewood Cliffs, NJ: Prentice Hall, Inc.

Shippy, R. D. (1981). Professional competencies needed by beginning teachers of agriculture/ agribusiness. *Journal of the American Association of Teacher Educators in Agriculture, 22*(1), 29-34.

Suydam, M. (1983). Teaching effectiveness. *Arithmetic Teacher, 31*(2), 3.

Young, M. (1990). Characteristics of high potential and at-risk teachers. *Action in Teacher Education, 11*(4)*,* 35-39.