

## **AGRICULTURE TEACHER EDUCATION PROGRAMS: A SYNTHESIS OF THE LITERATURE**

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### **Abstract**

*The role of teacher education programs and the demand placed upon those programs is changing. This study sought to synthesize research related to pre-service agricultural teacher education programs in the following areas: (1) demographics of teacher educators, (2) demographics of teacher education programs, (3) responsibilities of teacher education programs, (4) student selection, (5) preservice curriculum, (6) teacher education program models, and (7) field experiences. After a review of the literature in these areas, deficiencies in the current literature base were identified.*

### **Introduction**

Although the role of the teacher educator has changed over the past several years (Hillison, 1998), the preparation of individuals for teaching in middle school and high school agricultural education programs still remains the focal point of most agricultural education programs (Anderson, Barrick, & Hughes, 1992). Even though the goal of such programs may be agreed upon by the profession, the means by which to best achieve that goal is largely still unique to individual programs. As such, the course requirements, experiences, and admission requirements of teacher education programs differ considerably in some regards (Graham & Garton, 2001; Shinn, 1997; Swortzel, 1999).

Even as teacher educators take on additional responsibility divergent from the aforementioned focal point of teacher preparation, the needs of middle school and high school agriculture teachers are changing. Teachers of agriculture in the secondary schools are being called upon to integrate curriculum that addresses standards in science, mathematics, and other content areas. Success of this integration is being measured by state mandated standardized tests (Edwards, Leising, & Parr, 2002). Therefore, not only are teacher educators

learning new roles, they need to evaluate their traditional roles to be sure to prepare teachers to meet these new demands. In the midst of this inconsistency there is void of empirical research on teacher education in agriculture (Swortzel, 1999). This lack of empirical research leaves teacher educators with only anecdotal evidence on the development of teacher preparation programs.

Lytle (2000) warns that teacher education programs are becoming dated and marginal. Constant reflection is needed by teacher educators on their programs to find the most effective ways in which to fulfill their new roles as described by Hillison (1998) and their traditional roles of teacher preparation with the changing focus described by Edwards et al. (2002). Findings presented in this article provide a comprehensive review of research related to agriculture teacher education programs published 1989 – 2002.

### **Objective**

The objective of this paper was to synthesize research related to pre-service agricultural teacher education programs in the following areas: (1) demographics of teacher educators, (2) demographics of teacher education programs,

(3) responsibilities of teacher education programs, (4) student selection, (5) preservice curriculum, (6) teacher education program models, and (7) field experience. A second objective was to identify areas of deficiency in research related to agricultural teacher education programs.

### Procedures

Three sources were used to gather data to meet the objectives of the study: *Journal of Agricultural Education*, doctoral dissertations from *Dissertation Abstracts International*, and Proceedings from Regional and National Agricultural Education Research Meetings. These references were located through a computer library search completed at a Research I institution.

### Findings

#### *Demographics of Teacher Educators*

The cadre of agriculture teacher educators in the United States is quite homogenous. According to Swortzel (1996), the majority of agricultural teacher educators are Caucasian males who grew up in a traditional family in a small town atmosphere. Most are married, middle-aged, and employed at 1862 land grant institutions. Most have tenure and hold the rank of professor (Swortzel, 1998), indicating an aging profession. The majority of agricultural teacher educators are former secondary agricultural education teachers with little administrative experience before becoming a teacher educator. Although many teacher education programs have experienced a substantial increase in the number of urban and female students, the composition of teacher education faculty has not changed to reflect the new demographics. Swortzel (1998) reported that those females that do enter the professorate generally do so to take advantage of personal and professional development opportunities. He noted that males enter the profession wanting to share their interest in pedagogy and to receive external benefits associated with the job. Swortzel (1998) also noted that ethnic

minorities enter the education professorate because they want to assume a leadership role in teacher education and to influence other minorities to enter the teaching profession.

#### *Demographics of Teacher Education Programs*

A number of institutions with agricultural education programs are not actively producing certified agricultural education instructors. McLean and Camp (2000) reported that 93 institutions had agricultural education programs in 1996. Of these programs, 84 were active in teacher preparation. Of those, only 79 graduated any qualified students in 1995.

The administrative location of agriculture teacher education programs differs from institution to institution. Currently, almost 60% of the agricultural teacher education programs are administratively housed within colleges of agriculture. Approximately 23% are located within colleges of education (Swortzel, 1999).

As might be expected, the curricular structure of the various programs also differs greatly between institutions. McLean and Camp (2000) noted that the most common courses taught were methods of teaching, program planning, and student teaching. A large majority of programs (81%) have a curriculum that allows for agriculture teacher certification in four years. Certification is completed on a five-year course plan at 18% of the institutions.

There is great variability in the size of the various teacher preparation programs in agricultural education. Enrollment in programs ranges from 0 to 200 students with a mean near 41 students. The agricultural education faculty teaching equivalent (FTE) within each program ranges from 0 to 6.12 with a mean of 1.7. Most programs report one FTE in agricultural education. Almost all of the programs (96%) reported that they are accredited through a regional or national association (Swortzel, 1999).

The composition and length of the course of study for pre-service agriculture educators also varies widely across institutions. Degree programs at 4-year institutions require an average of 130.5

semester hours of course work. Of that, 44.7 hours is required in general studies, 42.8 hours in technical agriculture courses, and 35.8 hours in professional education coursework. Programs with a 5-year degree program require 138.7 semester hours, consisting of 51.2 hours of general studies, 47.3 hours in technical agriculture, and 46.6 hours of professional education coursework. Based upon percentage of total course plan, the 4-year and 5-year programs are nearly equal in number of hours in general studies (34% and 37%, respectively), and technical agriculture (33% and 34%, respectively). The major difference is in the percentage of professional education coursework. In the 4-year programs, professional education coursework comprises 27% of the course requirements, as compared to 34% in 5-year programs. Within this coursework, 71% of the programs require courses in multicultural education, 75% require courses in exceptional children, and 88% require classes in computers/instructional technologies. Students complete an early field experience prior to student teaching in 93% of the programs. These experiences ranged from 16 to 200 hours, with a mean near 60 hours. Student teaching experiences lasted an average of 12 weeks with a range of 10 to 24 weeks (Swortzel, 1999).

In general, students who complete teacher education programs are pleased with their experience. According to McGhee and Cheek (1990) students who graduate from teacher preparation programs perceived the adequacy of the coursework they received as above average to good in the areas of pre-professional studies, technical agriculture, and agricultural education. They rated agricultural education coursework highest, followed by technical agriculture and pre-professional coursework. The student teaching experience received the highest rating of any single course. Graduates indicated that the amount of technical agriculture courses should be increased, while the amount of pre-professional and agricultural education coursework should stay the same. Graduates also perceived the involvement in the agricultural education student organization as being of some to much value (McGhee & Cheek, 1990).

Preservice agricultural education students tend to be similar to their teacher educators on learning style characteristics. Raven, Cano, Garton, and Shelhamer (1993) reported that students enrolled in preservice agricultural education programs tended to be field-independent in their learning style. Likewise, females in agricultural education programs tended to be more field-independent than the national norm for females. Interestingly, students in agricultural teacher education programs tended to prefer learner-centered instruction. This contradicts what one would expect from a field-independent learner (Raven, Cano, Garton, & Shelhamer, 1993).

#### *Responsibilities of Teacher Education Programs*

The teacher educator's role has changed from one of preparing future teachers and providing professional development to current teachers, to including duties such as providing college and university faculty development, recruitment of students, and/or teaching college-wide courses (Hillison, 1998). Even with these changes in the roles of teacher education faculty, secondary agriculture teachers and state agricultural education staff perceive the greatest professional responsibility of teacher educators to be providing preservice teacher preparation. These groups also feel that teacher educators have a greater responsibility to coordinate and deliver professional development programs than to funding such programs (Anderson, Barrick, & Hughes, 1992).

#### *Student Selection*

No teacher certification measure was found to be predictive of agriculture teacher classroom teaching performance. However, the best predictor of teaching performance was found to be agricultural education coursework grade point average. Interestingly, the majority of secondary school administrators perceived higher academic abilities to be negatively related to a teacher's ability to relate and connect with students (Graham & Garton, 2001).

Graham and Garton (2001) concluded that current teacher preparation program admission and certification measures may be

excluding potential agriculture teachers. Muller and Miller (1993) reported that teachers with lower grade point averages were more likely to remain in teaching after one year. However, Muller and Miller found no significant differences in graduation grade point average, high school rank, or ACT score of graduates of a teacher education program versus other graduates.

#### *Pre-service Curriculum*

The goal of preservice teacher education is to make the most effective use of the time available to prepare future educators for the task awaiting them. However, as Lytle (2000) stated, "Clearly, it is unrealistic to assume that any preservice teacher education program can prepare prospective teachers for the wide array of tasks awaiting them as teachers" (p. 174). With this understanding, a number of studies have been completed that investigated the components included in the preservice curriculum of agricultural education (Selassie, 1989; Shelley, 2002; Shelley-Tolbert, Conroy, & Dailey, 2000; Shinn, 1997). In his evaluation of the agricultural teacher preparation program curricula, Swortzel (1996) noted that teacher education programs continued to use a traditional curriculum to teach preservice students. However, the curriculum that students will be expected to teach once they reach the secondary classroom has changed (Swortzel, 1996).

In investigating the teaching methods used by agriculture teachers, some commonalities have been reported. The most commonly used teaching methods in secondary agriculture classrooms were found to be lecture/discussion and general discussion (Selassie, 1989). However, no differences were found in the frequency of methods used due to years of experience in teaching. According to Selassie, teachers select the teaching method used to present material to their students based on professional training and subject matter knowledge. The criterion of "nature of students" and matching domains of learning with student intellectual development are less frequently used in the selection of the method by which material would be presented (Selassie, 1989). Shinn (1997)

reported that the most influential factor in the selection of teaching strategy and method is the number of courses taken in teaching and learning. Of the teaching strategies used, the most effective, as reported by teachers, are demonstrations, discussions, laboratories, projects, contests, using real objects, and supervised experience (Shinn, 1997).

Teachers see the need to adapt curricula and teaching strategies to close the gap between agricultural and academic education (Eaton, 1994). In an effort to fill that gap, Balschweid and Thompson (1999) called for providing preservice education for both agriculture and science teachers on the benefits of integrating science in the agriculture curriculum. To encourage teachers to make this integration, some states have provided a biological science endorsement for agricultural education teachers (Giustino & Straquadine, 1994).

Teachers define agriscience differently. Although no agreement has been reached on an exact definition of the term, most teachers agree that agriscience is an important part of the total curriculum (National Research Council, 1988). Likewise, with its relatively new inclusion into the curriculum, the methods by which science can be integrated should have greater emphasis (Connors & Elliot, 1994; Shelley, 2002). Balschweid (1998) reported that teachers who have completed a teacher education program with an integrated agriculture and science curriculum are more positive about integrating science into the agriculture curriculum, and are more willing to attend workshops about the integration of science.

#### *Teacher Education Program Models*

The model for agricultural education in the public schools has changed. Events that have occurred to necessitate the change in the model include changes in the agriculture industry, student population, society, educational system (graduation requirements, testing) and changes in the work place (National Research Council, 1988). In addition, there is an increased demand in the school-based agriculture programs to promote agricultural literacy to the general public (Hughes & Barrick,

1993), resulting in a need for curriculum revisions in teacher preparation programs.

Even in this time of curriculum revision, the primary focus of teacher preparation programs should be on the process of teaching and learning. The setting in which this process takes place (high school, extension programs, etc.) should be of secondary concern (Barrick, 1993). The first premise of Barrick's model is that the preparation of teachers is the central mission of the department. Barrick emphasizes his point saying,

To pretend that the original purpose should be changed or has been changed would be detrimental to the advancement of the department. Instead, as other programs are added the mission the centrality of the teaching/learning process becomes even more important. The one part of a department which separates it, makes it unique, when compared to other departments in agriculture is instruction in teaching and learning (p. 12).

According to Barrick (1993), all of the various components of a department should be related to this central mission of teaching and learning. He suggests that program mergers of convenience seldom work and can lead to division among the personnel involved.

#### *Field Experience*

Participating in an early experience opportunity aides students in their decision to pursue a career in agricultural education. As part of this early experience, the interaction between pre-service teachers and secondary agriculture students has been found to be the most influential factor, both positively and negatively (Zuch, 2000).

Students often express different attitudes at the conclusion of their student teaching internship than they do before the experience. The most important elements of student teaching as ranked by student teachers prior to their internship, were: a cooperating teacher who is a mentor, a cooperating teacher who communicates

clear expectations, and a discipline management plan used in a structured environment (Harlin, Edwards, & Briers, 2001). Harlin et al. noted that the lowest rated elements of student teaching by student teachers prior to the experience were: diversity within a student's supervised agricultural experience (SAE) program and a history of successful participation in the FFA. However, after the experience, the most important elements of student teaching, as rated by student teachers, were: a well-rounded program emphasizing instruction, SAEs, and youth leadership activities; and a student teacher who is willing to be mentored by the cooperating teacher. The lowest rated elements of the experience, as rated by student teachers after the experience, were: all students meeting state SAE requirements with accurate record books and diversity within students' SAEs (Harlin et al., 2001).

For prospective agriculture teachers, the cooperating teacher and the student teaching center are two of the most significant components of the student teaching experience (Edwards, Harlin & Briers, 2002; Harlin et al., 2001). A positive attitude by the cooperating teacher positively affects the student teacher's perception of the agriculture teaching profession (Edwards et al., 2002).

Cooperating teachers greatly influence the performance of student teachers (Edwards, Harlin et al., 2002; Garton & Cano, 1994; Harlin et al., 2001; McKee, 1991). Garton and Cano reported that the teaching methods and strategies espoused by the cooperating teacher affect those practices used by the student teacher. When cooperating teachers utilize the problem-solving approach to teaching, their student teachers were more likely to also utilize the problem-solving approach during student teaching and beyond (Garton and Cano, 1994; McKee, 1991). Garton and Cano also reported that both cooperating teachers and student teachers spent less than one fifth of their instructional time utilizing the problem-solving approach. Some never used this method, while others utilized the approach considerably. Neither cooperating teachers nor student teachers implemented all of the

procedures of the problem-solving approach (Garton & Cano, 1994).

In addition to the relationship between the cooperating teacher and the student teacher, the relationship between the cooperating teacher and the university supervisor also appears to be very important. Regarding this relationship, Deeds, Flowers, and Arrington (1991) reported that most cooperating teachers agreed with university expectations of student teacher performance. However, almost a fifth of the cooperating teachers did not know what was expected of them in their role.

#### *Deficiencies in the Research Base*

An analysis of the research conducted in preservice teacher education revealed deficiencies in the following areas:

1. Evaluation of coursework and experiences needed throughout the teacher preparation program to best prepare future teachers of agriculture.
2. An investigation of why more female and ethnic minorities are not entering the agricultural education professorate. In addition to identifying obstacles, solutions to these problems also need to be investigated.
3. A trend analysis of teacher education faculty numbers and identification of duties beyond traditional teacher education.
4. The importance of agricultural education student organizations in the preparation of future teachers of agriculture and in the recruitment and retention of students into teacher preparation programs.
5. An analysis of alternative certification practices for secondary teachers of agriculture.
6. Characteristics of successful cooperating teachers.
7. Characteristics of successful pre-service teachers.
8. Identification of predictors of success for student teachers.
9. Evaluation of the teacher education program model to determine if the current model is still the best fit for teacher education programs to fulfill

growing and diverse roles and responsibilities.

### **Conclusions and Recommendations**

The profession of agricultural teacher education is dominated by white males. There is a need to investigate why females and ethnic minorities in the secondary ranks are not choosing to enter the professorate. As more females are enrolling in programs, the need for female role models is increasing at the university level. Once these obstacles are identified, research should be conducted to identify means by which to address these impediments.

The most current information on the demographic make-up of the agricultural education profession is becoming dated. The profession of agricultural education needs to continually monitor itself. It is recommended that an ongoing project be implemented to assess the composition of the profession at regular intervals.

The majority of agriculture teacher preparation programs include a four-year program of study, including courses in teaching methods, program planning, and student teaching. On average, current programs of study are comprised equally of coursework in general studies, technical agriculture, and professional education courses (Swortzel, 1999). Further study is needed to identify the most effective coursework configuration. In addition, with the rise in the number of five-year programs, studies should be conducted to investigate the need for the extended coursework beyond the traditional degree programs. Furthermore, no research was found in the literature base that investigates the experiences needed to best prepare future teachers throughout the program. Whereas the coursework configuration is important in the preparation of teachers, the experiences students receive in those courses may be of greater concern.

The importance and role of agricultural education student organizations in teacher education programs have been mentioned briefly in the literature base, yet is in need of additional studies to verify their worth. Research should be conducted to determine the value of such organizations to preservice

teachers, both while enrolled in teacher preparation programs and once employed as teachers of agriculture. Moreover, if value is found in such organizations, studies should be conducted to indicate what activities conducted by these organizations are the most effective in accomplishing the tasks of teacher preparation and student retention.

Several studies indicated the effect of including instruction on the problem-solving approach, yet little has been done on the effectiveness of including methods of science integration into the curriculum. The societal changes that have occurred in the secondary agriculture programs have necessitated a change in teacher preparation programs. Major emphasis is being placed on how agricultural education can contribute to the academic achievement of students in the areas of science, mathematics, and reading. Research is needed to identify how agricultural education can fill this gap. Once this information is obtained, studies are needed to identify the best methods teacher educators can employ to prepare teachers for this expanded role.

Agricultural teacher preparation programs are primarily administratively housed within colleges of agriculture and include a wide range of faculty FTEs. It appears that the majority of individuals in the profession have concluded after the debates of the 1970s that the best fit for agricultural education programs on university campuses is within colleges of agriculture, with cooperative agreements with colleges of education (Binkley, 1977; Knebel, 1977). With the wide range of faculty FTEs reported for teacher education faculty and the finding that the role of the teacher educator has expanded beyond just the preparation of teachers, further research is needed to investigate the trends in the number of teacher education faculty located within these programs and their duties beyond teacher education.

Whereas research has not yet been able to identify variables that are effective in predicting teacher success, this search should continue. Research suggests that teacher preparation programs have admission requirements that are

often arbitrarily put into place. This could be excluding individuals that may be excellent agriculture teachers. If such predictive variables could be identified and used as admission criteria, the resources of teacher education programs could be more effectively focused on those individuals.

Both the student teaching experience and early field experiences have been found to have a positive impact on preservice teachers. However, the literature base is silent on characteristics of the individuals that should be selected as cooperating teachers for these experiences. Since these are such pivotal experiences in the teacher preparation program, more research is needed in this area.

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