

INSERVICE NEEDS AND PERCEIVED COMPETENCIES OF SOUTH CAROLINA AGRICULTURAL EDUCATORS

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Abstract

This study focused on inservice needs of beginning and experienced agriculture teachers in South Carolina. Based on the Borich Needs Assessment Model, a modified list of 50 competencies from previous research was developed to assess needs of South Carolina teachers (N = 105) during the 1999-2000 academic year. Using a census of the population, the perceived level of importance and perceived level of competence of the 50 competencies of the teachers were measured. To determine specific needs, beginning teachers (<5 years experience) and experienced teachers were analyzed separately. Overall inservice needs were analyzed and ranked using Mean Weighted Discrepancy Scores (MWDS). The top five competencies in need by experienced agriculture teachers included: using computers in classroom teaching; preparing FFA degree applications; preparing proficiency award applications; using multimedia equipment in teaching; and teaching recordkeeping skills. In contrast, beginning teachers listed the following top five competencies of need: utilizing a local advisory committee; developing local adult education programs; organizing fund-raising activities for the local FFA chapter; preparing agriculture/FFA contest teams; and developing SAE opportunities for students.

Introduction and Theoretical Framework

Our aging population, its growing diversity, changing career patterns, and advances in science and industry have all contributed to the changing nature of education among adults. Education is no longer viewed as preparation for productive adulthood; it is increasingly being seen as a lifelong necessity for personal and social well-being (Rachal, 1989). Without question, teachers are faced with challenges trying to provide an adequate learning environment and prepare their students for productive lives in today's fast-paced world. Now, more than ever, teachers are among those for whom learning is a lifelong proposition. There have been ways identified to train and retrain teachers, such as college courses, correspondence courses, self-learning experience, and inservice. Although training opportunities are plentiful, a critical factor in developing successful teachers is in correctly identifying their needs in highest demand.

Borich (1980) pioneered his Needs Assessment Model in an effort to design such a survey instrument that would allow one to collect data that can be weighted and ranked in order of priority. By doing so, responses can be linked to a practical decision framework to improve a training program. Borich defined a training need as "a discrepancy between an educational goal and trainee performance in relation to this goal." He further suggested that training programs could utilize his model by employing the two extreme positions: *what is* (the measured behaviors, skills, and competencies of trainees) and *what should be* (the goals of the training program). According to Borich, the discrepancy between these two positions can be used as an index to determine the effectiveness of training. The Borich Needs Assessment Model involves four steps:

1. List Competencies;
2. Survey Inservice Teachers;
3. Rank Competencies, and
4. Compare High Priority Competencies with Training Program Content.

In recent years, several studies have used Borich's needs assessment model to identify inservice needs of agriculture teachers (Garton & Chung, 1995; Edwards & Briers, 1999; Mundt & Connors, 1999). Garton and Chung (1995) used the Borich Needs Assessment Model in their study of beginning teachers in Missouri. Their study revealed 12 of the 50 professional competencies in greater need for inservice: completing reports for local/state administrators; motivating students to learn; preparing FFA degree applications; developing an effective public relations program; preparing proficiency award applications; teaching agriscience; utilizing a local advisory committee; developing SAE opportunities for students; using computers in classroom teaching; supervising students' SAE programs; teaching using experiments; and conducting local FFA chapter activities.

However, Garton and Chung (1995) also found that 10 of the 50 professional competencies were rated to be less of a need for inservice: teaching knowledge and skills in agricultural construction; teaching about and agriculture's relationship with the environment; teaching knowledge and skills in plant science; conducting parent/teacher conferences; using multimedia equipment in teaching; implementing VIMS in the local program; planning and conducting student field trips; developing knowledge and skills in animal science; teaching knowledge and skills in soils and soil management; and teaching equine science.

Edwards and Briers (1999) also used the Borich Needs Assessment Model for their study of entry-phase agriculture teachers in Texas. The findings of that study were on many levels consistent with the above-mentioned study by Garton and Chung (1995). For example, four of the top 15 competencies in the Edwards and Briers study were as follows: assisting students in preparing for and succeeding in FFA degree and award program, using the Internet as a teaching tool, implementing Tech-Prep and other School-To-Work initiatives into the program, and integrating computer-aided Design into agricultural mechanics.

Mundt and Connors (1999) conducted a three-stage Delphi study of the winners of the NVATA Outstanding Young Member

Award that was aimed at identifying problems and challenges associated with the first years of teaching agriculture. The top eight categories out on a list of 23 problems and challenges were as follows: managing the overall activities of the local FFA chapter; building the support of faculty, counselors, and administrators within the school system; balancing professional and personal responsibilities and maintaining personal motivation and a positive outlook; recruiting and motivating students in agricultural education; using proper classroom management strategies and dealing with student discipline problems; properly managing time, paperwork and meeting deadlines; building support from parents, organizations and adult groups within the community; and organizing and managing safe and attractive facilities.

Barrick, Ladewig, and Hedges (1983) stated that the identification of relevant topics can be crucial in providing agriculture teachers with quality inservice programs. In order to provide quality inservice programs, agriculture teachers' needs have to be monitored on a regular basis (Birkenholz & Harbstreit, 1987). According to Waters and Haskell (1989), "gathering data from potential clientele and actively involving them in the process of identifying potential educational programs, increases the likelihood of implementing relevant educational programs; thus, increasing the likelihood of achieving appropriate outcomes" (p. 26).

These concepts support Knowles' (1980) theory of andragogy, which contends that adults are more deeply motivated to learn topics that they see the need to learn. Adults may indicate apathy, resentment, and possibly, withdrawal when engaged in preplanned education. Knowles also proposed that adults should be engaged in planning of their learning experiences.

As can be seen from the literature review, many recent studies focused on needs of beginning agriculture teachers. In addition to these studies, however, more inservice needs assessment research on experienced teachers is necessary. Following the many changes in agriculture in general and re-structuring of agricultural education in South Carolina in particular,

inservice needs assessment has become imperative for both groups of teachers.

Purpose and Objectives

The purpose of this study was to identify and describe specific inservice needs of beginning and experienced agriculture teachers in the state of South Carolina. The objectives for the study were to:

1. Describe the demographic profile and program characteristics of South Carolina agriculture teachers (age, gender, highest degree earned, years of teaching, and curriculum taught);
2. Identify and describe the perceived inservice needs of South Carolina experienced agriculture teachers;
3. Identify and describe the perceived inservice needs of South Carolina beginning agriculture teachers;
4. Identify the five most common inservice needs among South Carolina beginning and experienced agriculture teachers;
5. Compare differences between the highest inservice needs of South Carolina beginning and experienced agriculture teachers, and
6. Identify the preferred inservice time offerings of South Carolina agriculture teachers.

Methods and Procedures

The population for the study consisted of all (beginning and experienced) agriculture teachers in the state of South Carolina ($N = 105$). For the purpose of this study, beginning teachers were considered to have between one and five years of teaching experience. Experienced teachers were considered to be those with more than five years of teaching experience. The list of agriculture teachers was obtained from the 1999-2000 South Carolina Directory of Agricultural Educators. A census of the population was used and as such, the findings from this study can only be generalized to the population.

The instrument used in the study was developed on the basis of the Borich Needs Assessment Model (Borich, 1980). A list of

50 professional competencies from previous research (Birkenholz & Harbstreet, 1987; Claycomb & Petty, 1983; Garton & Chung, 1995; Hachmeister, 1981; Kahler, 1974; Mundt, 1991; Shippy, 1981; Talbert, Camp & Heath-Camp, 1994; Valli, 1992; Veeman, 1984) was modified to meet the needs of South Carolina teachers.

The teachers were asked to rate on a Likert-type scale the 50 professional competencies related to inservice needs. Number one on the scale signified the least important competency and number five was the most important competency. The teachers were also asked to rate their self-perceived levels of the 50 professional competencies by using a Likert-type scale with number one meaning the least proficient in a particular competency and number five as the most proficient. The instrument also contained sections related to the Internet and computer software access, time of inservice delivery, and teachers' demographic information.

A panel of experts was asked to review the instrument for content and face validity. The panel consisted of faculty members in the department conducting the study. A post-hoc reliability analysis of the inservice needs section of the instrument had acceptable reliability (Cronbach's $\alpha = .83$).

Data were collected by sending the instrument and cover letter to all teachers in the study during March, 2000. To expedite the return rate, two options were suggested — teachers could return the completed instrument by fax or return it to their regional coordinators. The response rate for the study was 78 (74%). A *t*-test of the inservice needs and competency assessments revealed no significant differences between early and late respondents for both beginning and experienced teachers. Therefore, the findings of this study can be generalized to the population of both categories of agriculture teachers in South Carolina.

Statistical data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS 8.0) for Windows and Microsoft Excel 98. Descriptive statistics (frequencies, means, and standard deviations) were used to analyze data. A

MWDS was calculated to describe the overall rankings for each of the competencies.

To determine the MWDS, a discrepancy score was calculated for each individual on each competency by taking the importance rating minus the ability (competency) rating. A weighted discrepancy score was then calculated on each individual for each of the professional competencies by multiplying the discrepancy score by the mean importance rating. A MWDS for each of the competencies was calculated by taking the sum of the weighted discrepancy scores and dividing by the number of observations. Using the MWDS, the 50 competencies were then ranked.

Results and Findings

Objective 1 of the study was to describe the demographic profile and program characteristics of South Carolina agriculture teachers. The average number of years teaching was 14.7 years, while the most prevalent age group of the respondents was 41-50 (31.2%), followed by the 31-40 year age group (29.9%). Eighty-seven percent of the respondents were male and the most common academic degree held was a master's degree (59.7%), followed by a bachelor's degree (31.2%).

Regarding program characteristics, the primary curricula taught during the 1999-2000 school year was in the category of Horticulture and Agricultural Production (24.4%) followed by Agricultural Mechanics (16.7%), Environmental/Natural Resources (10.3%) and Agriscience (10.3%). Curricula of other programs included Turfgrass (5.3%), Forestry (1.3%), Agribusiness (1.3%), and Other (5.1%).

Objective 2 of the study was to describe the perceived inservice needs of experienced South Carolina agriculture teachers using the Borich Needs Assessment Model. Table 1 provides an analysis of the inservice needs of experienced teachers on the basis of the MWDS. The top 10 competencies included: using computers in classroom teaching (3.95); preparing FFA degree applications (3.91); preparing proficiency award applications (3.83); using multimedia equipment in teaching (3.60); teaching

record-keeping skills (3.19); developing an effective public relations program (3.00); developing SAE opportunities for students (2.68); completing reports for local/state/federal accountability (2.65); organizing a local Young Farmer Agribusiness program (2.20), and developing local adult education programs (2.04).

In comparison to the 10 most preferred competency needs for inservice (Table 1), the 10 least preferred included: assessing and evaluating student performance (.21); teaching knowledge and skills in plant sciences (.14); managing student behavior problems (.07); teaching knowledge and skills in soils and soil management (.00); organizing fund-raising activities for the local FFA chapter (-.06); developing relations with teachers and administrators (-.20); developing knowledge and skills in the animal sciences (-.23); planning banquets (-.30); conducting parent/teacher conferences (-.89), and planning and conducting student field trips (-1.05).

Objective 3 was to describe the perceived inservice needs of South Carolina beginning agriculture teachers as measured by the Borich Needs Assessment Model. The top 10 competencies included: utilizing a local advisory committee (5.56); developing local adult education programs (5.19); organizing fund-raising activities for the local FFA chapter (5.18); preparing agriculture/FFA contest teams (4.73); developing SAE opportunities for students (4.51); preparing FFA Degree applications (4.47); developing performance based assessment instruments (4.28); completing reports for local/state/federal accountability (4.26); preparing proficiency award applications (4.05), and supervising students' SAE programs (3.83).

In comparison to the 10 most preferred competency needs for inservice, the 10 least preferred included: teaching agriscience – integrating science and agriculture (1.56); planning banquets (1.51); conducting parent/teacher conferences (1.49); teaching knowledge and skills in small animal care (1.48); locating and selecting student references and materials (1.43); teaching knowledge and skills in plant sciences (1.35); teaching agricultural mechanics

skills (1.30); developing knowledge and skills in the animal sciences (1.13); planning

and conducting student field trips (0.94), and teaching equine science (0.63).

Table 1

In-service Needs of Experienced and Beginning Agriculture Teachers Using the Borich Needs Assessment Model (N = 60)

In-service Need	Experienced Teachers		Beginning Teachers	
	Placing	MWDS ^a	Placing	MWDS ^a
Using computers in classroom teaching	1	3.95	31	1.89
Preparing FFA degree applications	2	3.91	6	4.47
Preparing proficiency award applications	3	3.83	9	4.05
Using multimedia equipment in teaching	4	3.60	24	2.69
Teaching record-keeping skills	5	3.19	12	3.46
Developing an effective public relations program	6	3.00	11	3.61
Developing SAE opportunities for students	7	2.68	5	4.51
Completing reports for local/state/federal accountability	8	2.65	8	4.26
Organizing a local Young Farmer Agribusiness program	9	2.20	13	3.36
Developing local adult education programs	10	2.04	2	5.19
Teaching about public issues regarding agriculture	11	1.99	15	3.20
Teaching agribusiness knowledge and skills	12	1.95	36	1.69
Utilizing a local FFA Alumni affiliate	13	1.93	22	2.96
Motivating students to learn	14	1.91	14	3.33
Preparing agriculture/FFA contest teams	15	1.89	4	4.73
Teaching using experiments	16	1.82	23	2.70
Supervising students' SAE programs	17	1.74	10	3.83
Conducting needs assessments and surveys to determine the courses that should be taught	18	1.73	20	3.02
Teaching students problem-solving and decision-making skills	19	1.60	21	3.00
Locating and selecting student references and materials	20	1.50	45	1.43
Developing a Local Program Success Model	21	1.47	35	1.76
Teaching knowledge and skills in small animal care	22	1.43	44	1.48
Teaching about agriculture's relationship with the environment	23	1.30	32	1.88
Teaching equine science	24	1.27	50	0.63
Teaching agricultural leadership	25	1.25	40	1.58
Coordinating activities with local agricultural Organizations and activities	26	1.24	30	1.94
Conducting local FFA chapter activities	27	1.13	18	3.10

Table Continues

Table 1 Continued

In-service Need	Experienced Teachers		Beginning Teachers	
	Placing	MWDS ^a	Placing	MWDS ^a
Teaching learning disabled students	28	1.10	37	1.68
Teaching global agriculture awareness	29	1.08	38	1.63
Teaching agriscience – integrating science and agriculture	30	1.08	41	1.56
Organizing and supervising teaching laboratories	31	1.06	16	3.20
Teaching environmental occupations skills	32	1.04	29	2.00
Developing performance based assessment instruments	33	0.93	7	4.28
Teaching agricultural mechanics skills	34	0.93	47	1.30
Teaching knowledge and skills in marketing agricultural products	35	0.87	33	1.81
Planning a community-based program	36	0.77	25	2.56
Utilizing a local advisory committee	37	0.76	1	5.56
Determining the content to be taught in certain courses	38	0.69	28	2.19
Teaching knowledge and skills in forestry	39	0.44	27	2.27
Teaching knowledge and skills in horticulture	40	0.35	26	2.55
Assessing and evaluating student performance	41	0.21	17	3.13
Teaching knowledge and skills in plant sciences	42	0.14	46	1.35
Managing student behavior problems	43	0.07	39	1.62
Teaching knowledge and skills in soils and soil management	44	0.00	34	1.78
Organizing fund-raising activities for the local FFA chapter	45	-0.06	3	5.18
Developing relations with teachers and administrators	46	-0.20	19	3.05
Developing knowledge and skills in the animal sciences	47	-0.23	48	1.13
Planning banquets	48	-0.30	42	1.51
Conducting parent/teacher conferences	49	-0.89	43	1.49
Planning and conducting student field trips	50	-1.05	49	0.94

Note. ^a = MWDS: Mean Weighted Discrepancy Score

Objective 4 of the study was to identify the five most common in-service needs among South Carolina beginning and experienced agriculture teachers. An analysis of the highest placing in-service needs (as based on MWDS) found that five of the top 10 competencies were common.

The top five in-service needs (Table 2) were: developing local adult education programs; developing SAE opportunities for students; preparing FFA degree applications; completing reports for local/state/federal accountability; and preparing proficiency award applications.

Table 2

The Top Five Common In-service Needs of South Carolina Experienced and Beginning Agriculture Teachers (N = 60)

In-service Need	Placing	
	Experienced Teachers	Beginning Teachers
Preparing FFA degree applications	2	6
Preparing proficiency award applications	3	9
Developing SAE opportunities for students	7	5
Completing reports for local/state/federal accountability	8	8
Developing local adult education programs	10	2

Note. In-service need placing based on Mean Weighted Discrepancy Scores

Objective 5 of the study was to compare differences between the highest inservice needs of South Carolina beginning and experienced agriculture teachers. The top five competencies on which the beginning agriculture teachers had different responses were: utilizing a local advisory committee; organizing fund-raising activities for the local FFA chapter; preparing agriculture/FFA contest teams; developing performance based assessment instruments,

and supervising students' SAE programs (Table 3). The top five competencies on which experienced agriculture teachers differed from beginning agriculture teachers were: using computers in classroom teaching; using multimedia equipment in teaching; teaching record-keeping skills; developing an effective public relations program, and organizing a local Young Farmer Agribusiness program.

Table 3
Differences of Highest Inservice Needs Among Experienced and Beginning Agriculture Teachers (N = 60)

Experienced Teachers	Beginning Teachers
Using computers in classroom teaching	Utilizing a local advisory committee
Using multimedia equipment in teaching	Organizing fund-raising activities for the local FFA chapter
Teaching record-keeping skills	Preparing agriculture/FFA contest teams
Developing an effective public relations program	Developing performance based assessment instruments
Organizing a local Young Farmer Agribusiness program	Supervising students' SAE programs

Note. In-service need placing based on Mean Weighted Discrepancy Scores

Objective 6 of the study was to identify the preferred inservice time offerings of South Carolina agriculture teachers. The majority of teachers (66.7%) ranked summer as their first choice for workshop/seminar delivery. The winter conference was identified as the second preferred choice (16.9%), followed by district meetings (11.7%), fall semester (5.2%), and spring semester (1.3%).

Conclusions/Recommendations/ Implications

Conclusions/Implications

This study resulted in the following conclusions and recommendations. The top 10 competencies for inservice education that were ranked by experienced agriculture teachers (see Table 1) could be summarized in the two categories: integration of technology in the classroom and youth/adult development activities (FFA, Young Farmer and SAE). Regarding beginning agriculture teachers' responses, six of the top 10 competencies identified in this study were also identified by Garton and Chung's (1995) study of beginning agriculture

teachers in Missouri. The common findings were:

1. Utilizing a local advisory committee;
2. Developing SAE opportunities for students;
3. Preparing FFA degree applications;
4. Completing reports for local/state/federal accountability;
5. Preparing proficiency awards applications, and
6. Supervising students' SAE programs.

The similarities among beginning agriculture teachers in South Carolina and Missouri regarding inservice needs imply a possible national trend. Likewise, four of the five common inservice needs of beginning and experienced South Carolina agriculture teachers mirror the listing of beginning teachers in Missouri (Garton & Chung, 1995). The inservice need, developing local adult education programs, was unique to the study in South Carolina. The strong interest in developing adult education programs may be created by the

12-month contract mandate for active Young Farmer chapters.

The in-service needs in less demand were also found to have similarities between South Carolina experienced and beginning teachers, as well as beginning teachers in Missouri (Garton & Chung, 1995). All three groups indicated less need for inservice in the areas of: teaching knowledge and skills in plant sciences; developing knowledge and skills in animal sciences; conducting parent/teacher conferences; and planning and conducting student field trips. These findings imply that some edits may be necessary on the list used in this study if considered in future studies. Regarding the number of similar findings to the Garton & Chung (1995) study, it seems that the Borich Needs Assessment Model is a credible tool in assessing inservice needs of secondary agricultural educators.

Recommendations

Based on the findings and conclusions of this study, it is recommended that priority in planning professional development should be given to the top five common in-service needs of experienced and beginning agriculture teachers identified in this study. Additionally, the agricultural education leadership in South Carolina should consider specific opportunities that meet the top five in-service needs that were unique to experienced and beginning agriculture teachers, respectively. At the national level, findings from this and similar studies in agricultural education needs assessments should be considered by the National Agricultural Education Research Workgroup. This workgroup was established by the National Council for Agricultural Education in cooperation with the US Department of Education and the National FFA Organization in efforts to recommend specific research needs based on a gap analysis and to develop strategies to disseminate future findings to policy makers. Considering the common findings of inservice needs between South Carolina and Missouri agriculture teachers, a follow up study of national scope may provide insight regarding common needs. Some additional recommendations for consideration are:

- Teacher educators in the agricultural education program should develop graduate courses that address program administration needs and FFA/Young Farmer program development;
- Recently Clemson's College of Agriculture, Forestry and Life Sciences strategically placed Polycom (Internet-based Video-conferencing systems) access throughout South Carolina. It is recommended that a study of teacher perceptions toward the use of this and related media for inservice delivery should be conducted with South Carolina agriculture teachers;
- Development of related program administration and FFA/SAE/Young Farmer inservice activities should be scheduled on a rotating basis at the state summer convention for both experienced and beginning agricultural educators;
- Faculty in Clemson's agricultural education program should develop a schedule that addresses the top needs for beginning teachers at the semi-annual beginning teacher meetings on a rotational basis; and
- Faculty in Clemson's agricultural education program should study how the top inservice needs for the beginning teachers can be addressed in Clemson's agricultural education preservice program.

Based on the findings of this study, the department's agricultural education graduate committee realized the need for a course that focuses on the development of SAE programs. In the fall 2001 a graduate level SAE course was approved by the University Curriculum Committee and will be initiated in the near future.

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