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ABSTRACT

The inservice needs of entry-phase agriculture teachers in Texas were examined in a descriptive study that focused on Texas entry-phase agriculture teachers' personal and situational characteristics, their own assessment of their performance on specific competencies, and their need for inservice training on specific competencies. The target population consisted of all 165 entry-phase agriculture teachers in Texas. The 165 teachers were randomly placed in four groups, each of which received a different survey instrument. Each instrument focused on one of the following: student services competencies, program management competencies, personal roles and relationship competencies, and planning and managing educational tools and technologies. Of the 165 teachers, 91 (55%) submitted usable responses. Nearly 70% of the teachers were interested in pursuing a master's degree, and 50% preferred coupling inservice training with graduate credit. Only 20% selected distance education as their preferred method of receiving inservice education. Of the 163 competencies rated, 71 had a mean rating of 3.00 or higher. Facilitating adult learning environments was identified as the area in which inservice training is most needed, and facilitating balance in professional relationships the area in which inservice training is least needed. (Contains 28 references.) (MN)

Assessing Inservice Needs of Entry-Phase Agriculture Teachers in Texas

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Pressures, demands, and expectations placed on agriculture teachers make the old adage "the most constant thing in life is change" seem undeniable. If what futurists tell us is true--that the world's pool of knowledge doubles every 15 months (Catlett, 1997)--coupled with ever-increasing rate of change to modern agriculture, the prescribed pace for agricultural education may be greater. Webb, Stoner, and Vaclavik (1977) called for developing workshops and short courses aimed at "problems found to be of major concern" (p. 17) to first-year agriculture teachers. Mundt and Connors (1997) concluded, "The comprehensive nature of a quality program of high school agricultural education, perhaps, makes the tasks expected to be accomplished, more than can be reasonably expected during the first years of teaching" (p. 75). Studies that correlate student achievement with teacher qualifications, preparation, and expertise (Darling-Hammond & Falk, 1997), strike a chord for a need to inservice educators.

Theoretical/Literature Base

Mundt (1991, p. 22) found that "feelings of beginning agriculture teachers often focused on confusion, frustration and isolation." Huling-Austin (1986) found that 15 percent of new teachers leave the profession after just one year of service; more than 50 percent leave within five years (Olson & Rodman, 1988), as reported in Talbert, Camp, Heath-Camp (1994). A follow-up study of former teachers who left teaching cited dissatisfaction and "lack of recognition and support" as their primary reasons for leaving (Techniques, 1997, p. 30). Mundt and Connors (1997, p. 67) found "those activities which boosted teacher moral (sic) and provided encouragement during the first year were . . . very important." Popham (1993) instructs us that any difference between "desired status of learners" and "current status of learners equals an educational need" (p. 67). Borich (1980, p. 39), stated that needs are the difference between "what is" and "what should be." Garton and Chung (1995) and Mundt and Connors (1997) noted the relationship between problems entry-phase agriculture teachers encounter and opportunities the problems create for providing inservice.

Barrick, Ladewig, and Hedges (1983, p. 13) maintain a function of collegiate agricultural education departments "has been to identify the most relevant topics to provide teachers during various inservice education workshops." The literature is replete with "road-markers" to this end (Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Garton & Chung, 1995; Shippy, 1981; Webb et al., 1977). Garton and Chung (1995, p. 78) reminded us "the inservice needs of beginning agriculture teachers should be assessed and prioritized on a continual basis." More precisely, "research is needed to assess the inservice needs of today's beginning agriculture teachers" (Garton & Chung, 1995, p. 78).

There has been frequent conjecture about appropriate methods to use in conducting needs assessment. Borich (1980) described a needs assessment model based on a discrepancy score derived from a respondent-determined level of importance and level of performance for the specific competency being assessed. Barrick et al. (1983) determined that the discrepancy model (Borich, 1980) was appropriate for assessing inservice needs of agriculture teachers. Since then, several studies in agricultural education have used the Borich discrepancy model (Barrick & Doerfert, 1989; Barrick & Powell, 1986; Garton & Chung, 1995; McDonald & Lawver, 1997; McGregor & Lawver, 1997; Newman & Johnson, 1994). However, other researchers have used a more direct assessment of inservice needs (Birkenholz & Harbstriet, 1987; Claycomb & Petty, 1983; Farrington, 1981; Miller & Scheid, 1984; Shippy, 1981; Webb et al., 1977). Is direct assessment a valid measure for determining the inservice needs of teachers, as is the Borich discrepancy model?

Purposes and Research Questions

The purposes of the study were to identify inservice needs of entry-phase agriculture teachers in Texas and to test a direct assessment of inservice needs. These research questions guided the study: (1) What are personal and situational characteristics of entry-phase agriculture teachers in Texas? (2) How do entry-phase agriculture teachers grade their performance on specific competencies? (3) How do entry-phase agriculture teachers rate their need for inservice on specific competencies? and (4) Are performance grades related to rated need for inservice?

Methods/Procedures

In the spring of 1997, the Department of Agricultural Education at Texas A&M University in cooperation with the Texas Education Agency (TEA) conducted a descriptive study to assess inservice needs of entry-phase agriculture teachers in Texas. The target population for the study consisted of entry-phase teachers. "Entry-phase" was defined as teachers who began teaching during the school year 1994-95, 1995-96, or 1996-97. Those surveyed consisted of "additions" to the Directory: Texas Teachers of Agricultural Science and Technology for academic years 1994-95, 1995-96, and 1996-97. One hundred sixty-five teachers were identified as "entry-phase" teachers.

A list of competencies needed by agriculture teachers was developed based on a review of literature (Barrick & Powell, 1986; Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Farrington, 1981; Garton & Chung, 1995; Miller & Scheid, 1984; Shippy, 1981; Webb et al., 1977). Content validity of the instrument was established by agricultural educators in Texas; the conceptual framework for competencies originated from DACUM (Norton, 1995). The final list consisted of 163 different competencies, divided into 14 competency "areas." Three areas were determined to be "core competency areas": "Facilitating Student Learning in Classroom and Laboratory Settings" (22 competencies), "Facilitating Student Leadership and Personal Growth" (16 competencies), and "Facilitating Student Agricultural Experiences" (13 competencies).

To shorten the instrument, the remaining competencies were grouped as follows: "Student Services Competencies" (32 items); "Program Management Competencies" (24 items); "Personal Roles & Relationship Competencies" (33 items); "Planning & Managing Educational Tools & Technologies" (23 items). Members of the population were randomly assigned to one of four groups, with each group receiving a different instrument. A matrix sampling technique asked each subject to respond to the 51 core competencies and to approximately one-fourth of the remaining items (23 to 33 competencies). Teachers were asked to "grade" their level of performance for the selected competencies: "A" was "excellent", "B" was "good", "C" was "average", "D" was "low pass", and "F" meant "failing" (for

analysis, A=5, B=4, C=3, D=2, and F=1). Also, teachers rated their need for inservice training, with "5" meaning "highest need," "4" representing "much need," "3" was "some need," "2" being "little need," and "1" meant "no need." Finally, subjects responded to items describing themselves and their schools (Birkenholz & Harbstreit, 1987).

The first mailing, in March, 1997, included an instrument, a cover letter explaining the purpose of the survey, and a return envelope coded to determine non-respondents. In April, 1997, a reminder postcard was sent to non-respondents (Borg & Gall, 1989). Following the reminder postcard, a second instrument, a slightly-altered cover letter, and a second return envelope were mailed to non-respondents (Borg & Gall, 1989). Finally, an attempt was made to contact non-respondents via telephone. Some contacted by phone requested a third questionnaire; one was mailed to them. Three mailings, a reminder postcard, and telephone follow-up of non-respondents yielded a return rate of 55% (91 of 165).

Results

Over one-third (35%) of the entry-phase agriculture teachers were female, while males comprised nearly two-thirds (65%) of the population. This contrasts with findings of Farrington (1981) regarding the gender of beginning agriculture teachers in the Southern Region, which was overwhelmingly (93%) male. Eighty-one percent held a bachelor's degree while 19% had earned a master's degree. When asked about their interest "in a graduate program beyond your current degree," 69% said "probably yes" or "definitely yes," while less than ten percent responded "definitely not" or "probably not," and 21% were "unsure." Twenty-two percent held teacher certification in other areas (e.g., composite science); 78% did not. One-third were teaching in single teacher departments, while two-thirds were members of multiple teacher programs. More than two-thirds (69%) preferred receiving inservice through workshops held during the state teachers' conference (Table 1). Also, 62% preferred summer (not-for-credit) short courses and workshops. About one-half and one-third of the teachers, respectively, favored university courses offered for graduate credit and district and area teachers' meetings as means for delivery. Only

20% of the teachers indicated distance education technology as a preference. These findings agree with those of Garton and Chung (1995).

Table 1. Entry-Phase Agriculture Teachers' Preference(s) for Inservice Delivery (n=91)

Methods of inservice delivery	n	%
Workshops during the State Teachers' Conference	63	69.2
Summer (not-for-credit) short courses/workshops	56	61.5
University courses offered for graduate credit	45	49.5
District and area teachers' meetings	31	34.1
Training offered via distance education technology (e.g., satellite, videotapes, on-line computer)	18	19.8

A mean score was calculated for respondents' rating of their "need for inservice training" for each of the 163 competencies. Seventy-one competencies were rated as having "some need," "much need," or "highest need" for inservice ($0 \geq 3.00$) (Table 2). The other 92 competencies had mean rating scores <3.00, with 14 having means ≤ 2.25 ("little need") (Table 2). A mean score was calculated for each of the 163 competencies on which entry-phase teachers graded themselves. There were 28 competencies for which teachers graded their performance "good" or "excellent" ($0 \geq 4.00$). Nine of these are included in Table 2; all nine were "associated" with low ranking needs for inservice. Conversely, teachers graded their performance as "average," "low pass," or "failing" (3.00 and below) on 24 competencies. Nineteen are displayed in Table 2; all nineteen are associated with high ranking needs for inservice.

Pearson correlation coefficients were calculated to determine relationships between respondents' performance grades and their need for inservice. All correlations, with the exception of one, were negative. So, as grade for a competency declined, rating score for inservice increased. Conversely, the higher the grade, the lower the rating score for inservice. Twenty-eight competencies had correlation coefficients of $r = -.70$ to $-.86$, indicating a high negative correlation (Table 2). Eighty-five competencies had correlation coefficients ranging from $r = -.50$ to $-.69$, considered a moderate negative correlation. Forty-three competencies had a correlation coefficient that varied from $r = -.30$ to $-.49$, indicating a low negative relationship (Hinkle, Wiersma, & Jurs, 1994).

Table 2. Ranking of Inservice Needs of Entry-Phase Agriculture Teachers (N=91)

Rank	Competency	Inservice Rating	Performance Grade	Correlation Coefficient
1	Using Internet as a teaching tool	4.13	2.78	-.54**
2	Integrating CAD into ag mech	4.04	2.50	-.56**
3	Planning lab facilities for integrated courses such as physics with ag mech	3.91	2.87	-.20
4	Managing an adult education program	3.80	2.55	-.72**
5	Using distance education methods to deliver adult education in the community	3.75	2.45	-.73**
6	Planning & designing facilities to accommodate distance education tools e.g. satellite, video, or modem delivery	3.74	2.91	-.51*
7	Collaborating with other community adult education programs such as TAEX	3.70	2.80	-.69**
8	Planning materials and methods for new scheduling patterns such as block periods	3.70	3.48	-.33
9	Securing resources to conduct adult and continuing education programs	3.65	2.60	-.82**
10	Acquiring knowledge and skills for new equipment such as CAD software or DNA mapping	3.63	3.04	-.57**
11	Planning and conducting adult education within the community	3.60	2.55	-.74**
12	Maintaining and advising a TX Young Farmer Chapter	3.57	2.57	-.57**
13	Implementing Tech-Prep and other S-T-W initiatives into the program	3.57	2.92	-.76**
14	Securing administrative and counselor assistance in pre-registration & scheduling	3.54	3.58	-.39
15	Assisting students in preparing for and succeeding in FFA degree & award programs	3.53	3.31	-.52**
16	Renovating facilities to comply with safety and environmental standards	3.52	3.35	-.72**
17	Improving teaching methods for adults	3.50	2.70	-.80**
18	Involving resource people for adult education programs	3.50	2.50	-.85**
19	Planning & managing computer-aided learning activities	3.50	3.13	-.52**
20	Evaluating an adult education program	3.45	2.65	-.70**
21	Integrating biotechnology into existing program	3.43	3.26	-.58**
22	Establishing a Texas Young Farmer Chapter	3.43	2.67	-.67**
23	Integrating global agriculture (e.g., NAFTA) into existing courses policies	3.42	3.04	-.74**
24	Using the Internet as a career guidance tool	3.42	2.87	-.56**
25	Advising non-traditional SAEPs	3.40	3.28	-.57**
26	Obtaining assistance of administration in establishing program support groups	3.38	3.14	-.78**
27	Using computers as a teaching and learning tool	3.38	3.29	-.48*
28	Planning and maintaining a school land laboratory such as a project center	3.30	3.43	-.48*
29	Aiding students in preparing for & succeeding in LDEs	3.29	3.58	-.50**

Table 2. Continued

Rank	Competency	Inservice Rating	Performance Grade	Correlation Coefficient
30	Developing student recruitment strategies and programs	3.29	3.58	-.49*
31	Using a computer-assisted guidance system such as SIGI or DISCOVER	3.29	2.76	-.60**
32	Managing the SAEP point system as a grading criterion	3.28	3.52	-.59**
33	Implementing the SAEP Point-Guide-System	3.28	3.60	-.37**
34	Assessing adult learner needs and broad needs within the community	3.27	2.86	-.75**
35	Planning and conducting a major public relations event such as National FFA Week	3.27	3.00	-.63**
36	Assisting student's long-range course planning	3.25	3.58	-.32
37	Assisting students with portfolio development	3.25	3.17	-.64**
38	Using FFA activities to enhance student career success, such as Project PALS or MFE	3.24	3.18	-.55**
39	Communicating need for support group with administrators and school policies	3.24	3.48	-.67**
40	Assisting students in preparing for and succeeding in FFA CDE's	3.24	3.57	-.57**
41	Managing students with behavioral problems (discipline)	3.21	3.71	-.55**
42	Using strategies for maintaining support groups as advisors but not policy makers	3.19	3.24	-.85**
43	Creating positive attitudes and values about record-keeping skills	3.18	3.41	-.46**
44	Revising courses and materials based on new knowledge, techniques or equipment	3.17	3.58	-.39
45	Storing tools and maintaining inventories of tools, equipment, supplies, and materials	3.17	3.54	-.36
46	Organizing an external group for support of the program (e.g., FFA Alumni, Booster Clubs)	3.14	3.38	-.86**
47	Planning alternative scheduling for students who are designated as "honors"	3.13	3.39	-.48*
48	Planning and designing renovations of existing facilities for redirected programs	3.13	3.43	-.79**
49	Modifying teaching materials and methods to meet gifted and talented needs	3.13	3.79	-.28
50	Teaching how to keep good record-books	3.12	3.57	-.48**
51	Establishing a working relationship with local media	3.11	3.65	-.26
52	Managing and reducing work-related stress	3.10	3.29	-.68**
53	Planning internships and shadowing experiences	3.09	3.23	-.63**
54	Using support groups to publicize the program	3.09	3.23	-.49*
55	Advising students in developing SAEP's	3.09	3.65	-.59**
56	Control loss of tools, equipment, supplies, and materials	3.08	3.58	-.38
57	Addressing parental concerns about student enrollment and active participation	3.08	3.67	-.56**
58	Relating the point-guide-system to student grades	3.08	3.48	-.39**

Table 2. Continued

Rank	Competency	Inservice Rating	Performance Grade	Correlation Coefficient
59	Reducing policy conflicts with support groups	3.05	3.29	-.74**
60	Helping gather information about ag scholarships	3.04	3.67	-.31
61	Coordinating career planning with school counselors	3.04	3.38	-.48*
62	Using strategies to increase problem-solving and decision-making skills	3.04	3.67	-.59**
63	Using SAEPs to strengthen the AST curriculum and your program	3.03	3.60	-.53**
64	Involving non-traditional students in FFA activities	3.02	3.55	-.38**
65	Balancing classroom & lab teaching with FFA activities	3.02	3.72	-.53**
66	Supervising a year-round FFA program while employed on a less than year-round contract	3.01	3.85	-.53**
67	Stimulating student interest in FFA activities	3.01	3.86	-.54**
68	Sequencing courses to provide career pathways	3.00	3.63	-.42*
69	Securing business & industry participation in career discussions	3.00	3.21	-.54**
70	Using distance education technologies to earn graduate degree credits or certification	3.00	2.76	-.59**
71	Conducting a periodic needs assessment for facilities and equipment.	3.00	3.46	-.63**
	• • •			
150	Resolving conflicts between students and co-teachers	2.25	3.70	-.52*
151	Including significant others in professional activities	2.25	3.81	-.44
152	Interpreting & enforcing school policies & procedures	2.21	4.15	-.56**
153	Resolving conflicts between teachers	2.21	3.58	-.56*
154	Participating as an active member of professional organizations (e.g. VATAT)	2.20	3.95	-.63**
155	Providing appropriate chaperones for student activities	2.18	4.33	-.26*
156	Maintaining positive communications with co-teachers	2.15	4.33	-.77**
157	Resolving conflicts between students	2.15	4.24	-.67**
158	Preventing or resolving conflict with administrators and staff	2.15	4.05	-.59**
159	Accepting responsibilities and delegating authority for departmental roles and duties	2.10	4.14	-.73**
160	Managing relationships with AST teachers in other schools	2.10	4.10	-.76**
161	Coping with traumatic changes in relationships such as death or divorce	2.05	3.85	-.46*
162	Managing relationships with other constituencies such as Agricultural Extension Agents or county boards	1.95	4.38	-.71**
163	Creating and nurturing an environment of trust	1.80	4.43	-.76**

[a] Rating: 5=Highest Need, 4=Much Need, 3=Some Need, 2=Little Need, 1=No Need

[b] Grade: 5=Excellent, 4=Good, 3=Average, 2=Low Pass, 1=Failing

[c] Pearson Correlation Coefficient

* $p<.05$, ** $p<.01$

Conclusions, and Educational/Practical Importance

The population of entry-phase agriscience teachers in Texas for academic years 1994-97 has more females than did previous studies. Based on anecdotal evidence from recent student teaching groups at Texas A&M University, this appears to be a trend. Nearly 70% were interested in pursuing a master's degree (one-fifth of entry-phase teachers held one), and 50% preferred to couple inservice training with graduate credit, more research should be conducted on how to simultaneously meet these needs. It was interesting that only 20% of the respondents indicated distance education technology as a preference for receiving inservice education? Distances in Texas and much of the West amplify this point. Is this an issue of unfamiliarity with the technology (Garton & Chung, 1995), or is it a lack of access to the technology? These questions warrant further study.

Of the 163 competencies rated by the respondents on their need for inservice, 71 had a mean rating score of 3.00 or greater, indicating at least "some ..., much ..., or highest need" for inservice. These highly rated competencies represented all of the competency areas. Special attention should be paid to the ranking of competencies based on the mean rating score of "need for inservice" (Table 2), with the highest ranking competencies given priority for delivery. Based on the findings of this study, it appears entry-phase teachers, when asked directly, rated their need for inservice greatest on competencies related to an area of "Facilitating Adult Learning Environments." On the other hand, entry-phase teachers graded their performance high in an area of "Facilitating Balance in Professional Relationships;" thus, they rated their need for inservice low on competencies in this area. However, this is contrary to research presented by Claycomb and Petty (1983), and due to this difference, it appears this area bears further investigation.

Based on the findings of this study, it can be concluded that when asking respondents to both "grade" their level of performance and "rate" their need for inservice training for a given competency, the competencies that received a high rating for inservice also received a relatively low performance grade, and vice-versa. In a sense, is this form of direct assessment just asking the same question twice? Is this the most valid procedure for determining and prioritizing the inservice needs of entry-phase agriculture

teachers? Barrick et al. (1983, p. 15) "hypothesized that there would be a significant difference among the rankings of the topics [for inservice] by importance scores, knowledge scores, and application scores." Barrick, et al., further stated that to select inservice topics based on one ranking " would be less reliable than selecting topics based upon a combination of rankings"(1983, p. 16), i.e., the Borich model. Borich has said, "It [Borich Needs Assessment Model] is sufficiently direct that data analysis and instrument construction are no more complex than with any type of follow-up survey; yet it yields more data, and more understandable data, than many other types of follow-up questionnaires" (Borich, 1980, p. 42). Barrick, et al. (1983) tested the Borich model and found the use of only one ranking, whether it is importance, knowledge, or application, "may not be valid" (p. 19), and that "A combination of two or more rankings must be considered to form conclusions regarding inservice education needs" (p. 19). Furthermore, Barrick, et al., concluded "The [Borich] model provided defensible data in identifying important topics in which teachers need further knowledge" (1983, p. 19). Other researchers have supported Barrick's conclusions, among them Newman and Johnson (1994), who concluded "Rankings of the units [from agriculture courses] based on the mean weighted discrepancy scores appeared to be quite different from rankings of the units based solely on importance or competence" (p. 60).

If the respondents to this study had been asked to provide a level of importance rating for the competencies measured, and in turn, a mean weighted discrepancy score calculated, would the final rankings of inservice priorities be the same? Witkin (as cited in Garton & Chung, 1997) maintains that no needs assessment model has gained universal acceptance, nor is there sufficient empirical evidence to support the use of one model over another. Further, "Witkin concluded that the educational needs of a group could be better identified by using a variety of needs assessment models" (Garton & Chung, 1997, p. 52). It is strongly recommended that a second survey of this same population be conducted, asking teachers to indicate "level of importance" for the same 163 competencies. Then, one could calculate a mean weighted discrepancy score, rank the scores, and compare those rankings with the current rankings. Only then could the question of inservice needs be answered.

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