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AN ASSESSMENT OF THE INSERVICE NEEDS OF BEGINNING TEACHERS OF AGRICULTURE USING TWO ASSESSMENT MODELS

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Abstract

The purpose of the study was to identify and prioritize the inservice needs of beginning teachers of agriculture in the state of Missouri. The target populations for the study consisted of beginning agriculture teachers in Missouri during the 1994-95 academic year (N=37) and members of the Joint State Staff in Agricultural Education, which included teachers educators and state supervisor (N=16). Census populations were used. The Borich needs assessment model was used to assess the perceived level of importance and competence of beginning teachers regarding 50 professional competencies. A quadrant analysis utilizing discrepancy scores from beginning teachers and the Joint State Staff for each of the 50 professional competencies was also performed From the results of the Borich needs assessment model, I2 competencies were identified as having a greater need for inservice education. As a result of the quadrant analysis model, 16 competencies were identified as having a greater need for inservice education. In general, the inservice needs identified using the Borich needs assessment model corresponded with the inservice needs identified by the quadrant analysis model.

Agriculture teachers have had and continue to have a need for inservice education. Historically, inservice programs have been conducted to assist agriculture teachers, especially beginning teachers, in learning the knowledge and skills necessary to perform their teaching roles (Bar-rick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993). Many of these inservice programs have been developed based on research (Hillison, 1977; Shippy, 198 1; Hachmeister, 198 1; Claycomb & Petty, 1983; Veeman, 1984; Birkenholz & Harbstreit, 1987; Valli, 1992) that identified the needs of beginning teachers. What were the needs of beginning teachers as identified by the previous research?

Veeman (1984), in a study of teachers across subject matter disciplines, identified eight problems frequently faced by beginning teachers. The problems included: classroom discipline, motivating students, dealing with individual differences, assessing students' work, relationships with parents, organization of class work, insufficient and/or inadequate teaching materials and supplies, and dealing with problems of individual students (Veeman, 1984).

Researchers (Shippy, 198 1; Hachmeister, 198 1; Claycomb & Petty, 1983; Birkenholz & Harbstreit, 1987; Mundt, 1991; Talbert, Camp, & Heath-Camp, 1994) have also identified the inservice needs of beginning teachers of agriculture. Hillison (1977) found that beginning teachers of agriculture placed a high need for inservice on such responsibilities as completing state department reports, planning lessons, and ordering materials for the department. Shippy (1981) and Mundt (1991) concluded that beginning teachers perceived their highest need in the areas of program planning, development, and evaluation; planning, execution, and evaluation of instruction; and managing student behavior. Additionally, Birkenholz and Harbstreit (1987) found that the greatest need for inservice appeared in the areas of using computers in the classroom, developing skills in agribusiness management and electricity, training agriculture/FFA contest teams, and assisting students with SAEP records.

Although many studies have provided information with regard to the inservice needs of beginning teachers of agriculture, Claycomb and Petty (1983) concluded that the inservice needs of beginning teachers change over time. Furthermore, Birkenholz and Harbstreit (1987) stated that the inservice needs of beginning agriculture teachers should be assessed and prioritized on a continual basis. Therefore, research is needed that assesses the inservice needs of today's beginning teachers of agriculture. But which educational needs assessment model would best address the problem?

Witkin (1984) noted "there is no one model or conceptual framework for needs assessment that has been universally accepted, and there is little empirical evidence of the superiority of one approach over another" (p. 29). In addition, Witkin (1984) concluded that the educational needs of a group could be better identified by using a variety of needs assessment models.

Borich (1980) described an approach to conducting educational needs based upon a discrepancy model. This model utilized survey methodology in which respondents provided data that could be weighted and ranked in order of priority. Borich (1980) stated that "... the needs assessment model is essentially a self-evaluative procedure which relies on teachers' judgments about their own performances. The assumption underlying the needs model is that the performer (teacher) can best judge his or her own performance and, when explicitly asked to do so, can make an objective judgement" (p. 42). In addition to Borich, others have defined approaches to assessing educational needs.

A quadrant analysis model was used by Gable, Pecheone, and Gillung (198 1) to establish priorities for training teachers and other school personnel. In the quadrant analysis model, a 2x2 matrix is used with one dimension represented teachers' self-desired competencies and the second dimension represented ratings by experts on the importance of those competencies. Witkin (1984) concluded that the quadrant analysis model provided a method to use importance as a qualifying factor in deriving priorities and avoided the fallacy of basing priority decisions on simple discrepancies.

Purpose and Research Questions

The purpose of the study was to identify and prioritize the inservice needs of beginning teachers of agriculture in the state of Missouri. The following research questions were developed to guide the study:

1. What were the perceived inservice needs of beginning teachers of agriculture using the Borich needs assessment model?

2. What were the inservice needs of beginning teachers of agriculture as perceived by the teachers and the Joint State Staff using the quadrant analysis model?

Methods/Procedures

The target populations for the study consisted of beginning (first- and second-year) teachers of agriculture in Missouri during the 1994-l 995 academic year (N=37) and members of the Joint State Staff in Agricultural Education, which included teacher educators and state supervisor (N=l6). Census populations were used; therefore, sampling procedures were not utilized and generalizability of the results was limited to the populations of the study.

To address to the first research question, an instrument using the Borich (1980) needs assessment model was developed to assess the beginning teachers' perceived level of importance and perceived level of competence regarding 50 professional competencies. The professional competencies were identified from previous research (Kahler, 1974; Shippy, 198 1; Hachmeister, 1981; Claycomb & Petty, 1983; Veeman, 1984; Birkenholz & Harbstreit, 1987; Mundt, 199 1; Valli, 1992; Talbert, Camp, & Heath-Camp, 1994).

The beginning teachers were asked to rate, using a five-point Likert scale, 50 professional competencies on the importance to their success as a beginning teacher. A response of one indicated the competency was not important and a five indicated the competency was very important to their success. The beginning teachers were also requested to rate their perceived competence level with regard to the 50 professional competencies, again using a five-point Likert scale. A response of one indicated they were not competent and a five indicated they were very competent in performing the competency.

A *discrepancy score* for each individual on each professional competency was calculated by taking the importance rating minus the ability (competence) rating. A *weighted discrepancy score* was then calculated for each individual on each of the professional competencies by multiplying the discrepancy score by the mean importance rating. A *mean weighted discrepancy score* for each of the professional competencies was calculated by taking the sum of the weighted discrepancy scores and dividing by the number of observations. The 50 professional competencies were then ranked using the mean weighted discrepancy scores.

The instrument was assessed for content and face validity by graduate associates, teacher educators, and state supervisors in Agricultural Education. Reliability of the instrument was .95 (Cronbach's alpha coefficient).

To address the second research question, a quadrant analysis based on two dimensions was performed. The quadrant analysis was established using a 2x2 matrix, one dimension was graphically represented by the beginning teachers' discrepancy score for each of the 50 professional competencies. The second dimension was a graphic representation of discrepancy scores for each of the 50 professional competencies as established by the Joint State Staff.

The discrepancy scores, established by the Joint State Staff, were determined by using the instrument developed for the beginning teachers and modifying the directions. Members of the Joint State Staff were asked to rate, using a five-point Likert scale, the 50 professional competencies on the importance to the success of beginning teachers. In addition, they were requested to rate the perceived competence level of beginning teachers on the 50 professional competencies using a five-point Likert scale. The discrepancy score for each competency was calculated by taking the importance rating minus the competence rating.

The four quadrants in the quadrant analysis were (I) high discrepancy as established by teachers and high discrepancy as established by the Joint State Staff, (II) high discrepancy for teachers and low discrepancy for the Joint State Staff, (III) low discrepancy for teachers and high discrepancy for the Joint State Staff, and (IV) low discrepancy for teachers and low discrepancy for the Joint State Staff Witkin (1984) stated that those competencies falling within quadrant I constituted priorities for inservice programs, but those falling in quadrant II and III should also be discussed and reinforced. Competencies in quadrant IV could be interpreted as successful, with no inservice education needed.

Results/Findings

An analysis of the inservice needs of the beginning teachers of agriculture, using the Borich model, indicated that 12 of the 50 professional competencies were in greater need for inservice (Table 1). The 12 highest rated competencies had mean weighted discrepancy scores greater that 4.0. The 12 competencies included: completing reports for local/state administrators (7.4), motivating students to learn (6.O), preparing FFA degree applications (5.7), developing an effective public relations program (5.5), preparing proficiency award applications (5.4), teaching agriscience - integrating science and agriculture (5. l), utilizing a local advisory committee (5.1), developing SAE opportunities for students (4.9), using computers in

Table 1. The Inservice Needs of Beginning Teachers of Agriculture Using the Borich Needs Assessment Model (N=37)

Ranking	Inservice needs	Imp. level[a]	Comp. level[b]	MWDS
1	Completing reports for local/state administrators	4.49	2.84	7.40
2	Motivating students to learn	4.84	3.57	6.02
3	Preparing FFA degree applications	4.37	3.08	5.73
4	Developing an effective public relations program	4.73	3.57	5.50
5	Preparing proficiency award applications	4.33	3.08	5.42
6	Teaching agriscience - integrating science and agriculture	4.30	3.11	5.11
7	Utilizing a local advisory committee	4.59	3.49	5.09
8	Developing SAE opportunities for students	4.49	3.41	4.85
9	Using computers in classroom teaching	4.08	2.97	4.52
10	Supervising students' SAE programs	4.42	3.44	4.29
11	Teaching using experiments	4.22	3.21	4.10
12	Conducting local FFA chapter activities	4.58	3.69	4.03
13	Managing student behavior problems	4.51	3.65	3.90
14	Conducting needs assessments and surveys	4.16	3.24	3.83
15	Teaching students problem-solving and decision making skills	4.54	3.68	3.78
16	Developing Tech Prep programs	3.65	2.65	3.65
17	Teaching knowledge and skills in electricity	3.84	2.97	3.55
18	Evaluating the local agriculture program	4.38	3.57	3.55
19	Organizing and supervising teaching laboratories	4.19	3.35	3.51
20	Determining the content for specific courses	4.32	3.65	3.39
21	Teaching recordkeeping skills	4.51	3.78	3.29
22	Preparing agriculture/FFA contest teams	4.08	3.31	3.29
23	Coordinating activities with local agricultural organizations and agencies	4.19	3.43	3.17
24	Teaching learning disabled students	4.03	3.24	3.16
25	Utilizing a local FFA Alumni affiliate	3.78	2.97	3.04
26	Organizing fund raising activities for the local FFA Chapter	4.42	3.75	2.95
27	Assessing and evaluating student performance	4.38	3.73	2.84
28	Organizing a local FBMA program	3.17	2.31	3.73
29	Conducting an adult program	3.61	2.86	2.71
30	Locating and selecting student references and materials	4.28	3.67	2.61
31	Teaching knowledge and skills in marketing products	4.16	3.54	2.59
32	Repairing and reconditioning agricultural mechanics tools and equipment	3.95	3.32	2.45
33	Teaching knowledge and skills in forestry	3.42	2.72	2.37
34	Teaching about public issues regarding agriculture	4.14	3.57	2.35
35	Developing performance based assessment instruments	3.57	2.92	2.31
36	Developing relations with fellow teachers and administrators	4.59	4.14	2.24
37	Planning banquets	4.14	3.61	2.18
38	Teaching agribusiness knowledge and skills	4.14	3.62	2.12
39	Teaching small gas engines	3.24	2.59	2.10
40	Teaching knowledge and skills in horticulture	3.46	2.86	2.06
41	Teaching knowledge and skills in agricultural construction	4.16	3.68	1.80
42	Teaching about agriculture's relationship with the environment	4.11	3.68	1.78
43	Teaching knowledge and skills in the plant sciences	4.08	3.68	1.65
44	Conducting parent/teacher conferences	1.25	3.86	1.65
45	Using multimedia equipment in teaching	3.73	3.30	1.61
46	Implementing VIMS in the local program	3.19	2.76	1.38
47	Planning and conducting student field trips	3.76	3.47	1.12
48	Developing knowledge and skills in the animal sciences	4.25	4.06	.83
49	Teaching knowledge and skills in soils and soil management	3.90	3.49	.80
50	Teaching equine science	2.75	2.61	.38

a Importance Level: 5 = Very Important, 4 = Important, 3 = Somewhat Important, 2 = Of Little Importance, 1 = Not Important
b Competence Level: 5 = Very Competent, 4 = Competent, 3 = Somewhat Competent, 2 = Little Competence, 1 = Not Competent
c MWDS: Mean Weighted Discrepancy Score

classroom teaching (4.5), supervising students' SAE programs (4.3), teaching using experiments (4.1), and conducting local FFA chapter activities (4.0).

Ten of the 50 professional competencies, as perceived by the beginning teachers, received a mean weighted discrepancy score less than 2.0, indicating less of a need for inservice. The 10 lowest rated professional competencies were: teaching knowledge and skills in agricultural construction (1.8), teaching about and agriculture's relationship with the environment (1.8), teaching knowledge and skills in the plant sciences (1.7), conducting parent/teacher conferences (1.7), using multimedia equipment in teaching (1.7), implementing VIMS in the local program (1.4), planning and conducting student field trips (1.1), developing knowledge and skills in the animal sciences (.8), teaching knowledge and skills in soils and soil management (.8), and teaching equine science (.4).

With regard to the quadrant analysis model, 16 of the 50 professional competencies were classified in quadrant I as a result of receiving high discrepancy scores from both teachers and the Joint State Staff (Table 2, Figure 1). Quadrant II contained nine competencies that received high discrepancy scores from the teachers and low discrepancy scores from the Joint State Staff. Six competencies were located in quadrant III, indicating low discrepancy scores from the teachers and high discrepancy scores from the Joint State Staff. As a result of receiving low discrepancy scores from the teachers and the Joint State Staff, nineteen competencies were located in quadrant IV.

Conclusions and Recommendations

From the results of the Borich needs assessment model, 12 of the 50 professional competencies were identified by the beginning teachers as having a greater need for inservice education. Of the 12 professional competencies, five were classified in the category of instruction, five in the category of program planning, development, and evaluation, and two in the category of program administration as defined by Shippy (1981).

As a result of the quadrant analysis model, 16 of the 50 competencies were identified by the beginning teachers and the Joint State Staff as having a greater need for inservice education. Of the 16 professional competencies, eight were classified in the category of instruction, six in the category of program planning, development, and evaluation, and two in the category of program administration.

The ten competencies identified with the greatest need for inservice, as a result of the quadrant analysis model, were included in the 13 highest rated inservice needs as prioritized by the beginning teachers using the Borich needs assessment model. From the quadrant analysis model, the eighteen least needed inservice needs for beginning teachers were included in the 21 lowest rated inservice needs as prioritized by the beginning teachers using the Borich needs assessment model. As in the Borich needs assessment model, the technical agriculture knowledge and skill competencies were ranked lower in priority in the quadrant analysis model when compared to competencies in the areas of instruction, program planning, development and evaluation, and program administration.

The professional competency with the greatest need for inservice education, as perceived by beginning teachers and the Joint State Staff, was in completing reports for local and state administrators which supported the conclusions of previous research (Hillison, 1977; Claycomb & Petty, 1983). Motivating students to learn was identified by the Borich needs assessment model and the quadrant analysis model as the second most needed area of inservice, which supported Veeman's (1984) conclusion of being a frequent problem faced by beginning teachers.

Table 2. The Inservice Needs of Beginning Teachers of Agriculture as Determined by the Quadrant Analysis Model

Quadrant	Item number	Inservice needs	Discrepancy Scores BT[a]	Discrepancy Scores JSS[b]
I	2.	Completing reports for local and state administrators	4.95	2.25
	46.	Motivating students to learn	3.81	3.89
	20.	Developing an effective public relations program	3.49	4.00
	26.	Teaching agriscience - integrating science and agriculture	3.57	2.13
	32.	Utilizing a local advisory committee	3.32	3.88
	8.	Developing SAE opportunities for students	3.24	2.50
	11.	Supervising students' SAE programs	2.92	3.00
	15.	Teaching using experiments	2.84	2.50
	23.	Conducting local FFA chapter activities	2.67	2.63
	37.	Managing student behavior problems	2.59	4.13
	16.	Teaching students problem-solving and decision making skills	2.51	2.75
	39.	Evaluating the local agriculture program	2.43	3.00
	12.	Organizing and supervising teaching laboratories	2.51	3.13
	17.	Teaching learning disabled students	2.27	2.25
	22.	Coordinating activities with local agricultural organizations and agencies	2.35	2.50
	28.	Organizing a local FBMA program	2.58	2.38
II	49.	Preparing FFA degree applications	3.92	2.00
	50.	Preparing proficiency award applications	3.75	1.75
	4.	Using computers in classroom teaching	3.32	1.25
	25.	Conducting needs assessments and surveys	2.76	1.63
	47.	Developing Tech Prep programs	3.00	1.13
	44.	Teaching knowledge and skills in electricity	2.76	1.88
	38.	Determining the content for specific courses	2.35	1.75
	3.	Preparing agriculture/FFA contest teams	2.33	1.00
	41.	Utilizing a local FFA alumni affiliate	2.42	1.00
III	21.	Teaching recordkeeping skills	2.19	.75
	35.	Assessing and evaluating student performance	1.95	3.00
	13.	Conducting and adult program	2.25	3.50
	7.	Repairing and reconditioning agricultural mechanics tools and equipment	1.86	3.38
	45.	Developing relations with fellow teachers and administrators	1.38	2.63
	18.	Conducting parent/teacher conferences	1.17	2.63
IV	42.	Organizing fund raising activities for the local FFA chapter	2.00	1.63
	27.	Locating and selecting student references and materials	1.83	2.00
	24.	Teaching knowledge and skills in marketing products	1.86	1.88
	43.	Teaching knowledge and skills in forestry	2.08	1.38
	40.	Teaching about public issues regarding agriculture	1.70	2.00
	30.	Developing performance based assessment instruments	1.95	1.00
	48.	Planning banquets	1.58	1.75
	9.	Teaching agribusiness knowledge and skills	1.54	1.00
	14.	Teaching small gas engines	1.95	1.00
	10.	Teaching knowledge and skills in horticulture	1.78	1.25
	36.	Teaching knowledge and skills in agricultural construction	1.46	1.38
	34.	Teaching about agriculture's relationship with the environment	1.30	1.88
	19.	Teaching knowledge and skills in the plant sciences	1.22	1.13
	5.	Using multimedia equipment in teaching	1.30	1.88
	6.	Implementing VIMS in the local program	1.30	1.25
	1.	Planning and conducting student field trips	.92	.00
	31.	Developing knowledge and skills in the animal sciences	.58	1.25
	29.	Teaching knowledge and skills in soils and soil management	.65	1.88
	33.	Teaching equine science	.42	.63

Note. [a]Beginning Teachers
[b]Joint State Staff

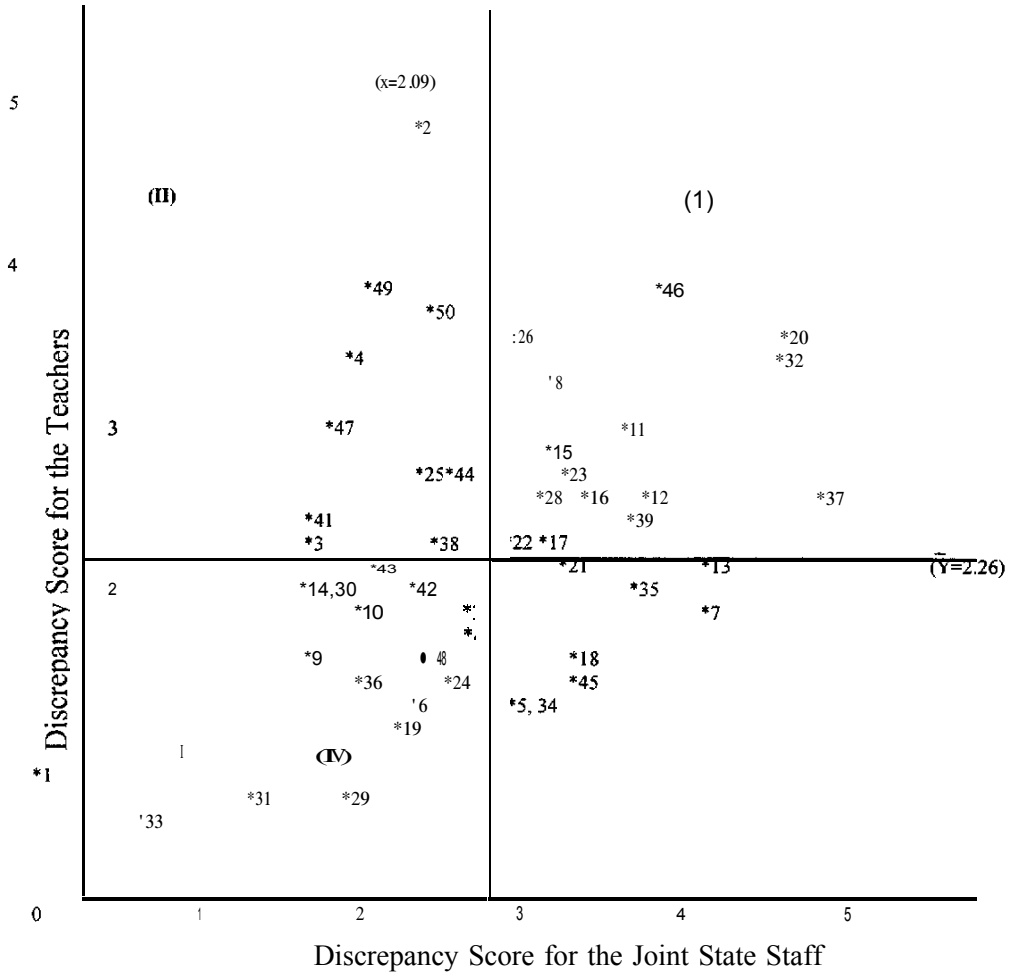

Figure 1. Quadrant Analysis of the Inservice Needs of Beginning Teachers of Agriculture

Many teachers of agriculture graduate from teacher preparation programs claiming to lack the necessary technical agriculture knowledge and skills to be successful teachers (Claycomb & Petty, 1983). However, the technical agriculture knowledge and skill competencies were rated lower in priority for inservice when compared to the professional competencies in the areas of instruction, program planning, development, and evaluation, and program administration. Therefore, it can be concluded that the beginning teachers and Joint State Staffperceived that technical agriculture competence was not as much a factor in the success of beginning teachers as were the other professional competencies. This conclusion is supported by Claycomb and Petty's (1983) fmding that the need for assistance in human relations and program administration increased and outweighed technical expertise during the first year of teaching.

In general, the inservice needs that were identified using the Borich needs assessment model, as perceived by the beginning teachers, corresponded with the inservice needs identified through the quadrant analysis model, as perceived by the beginning teachers and the Joint State Staff

Therefore, it can be concluded that when identifying the inservice needs of beginning teachers of agriculture using either the Borich model or the quadrant analysis model are acceptable approaches that yield similar results.

It is recommended that the findings of this study be taken into account as teacher educators in Missouri plan and develop inservice courses for beginning teachers. Inservice should focus on enhancing instruction and program development and administration. The specific inservice needs with the highest ranking should be given priority when planing and developing inservice programs for beginning teachers. In addition, the current study should be replicated in other states to determine if the inservice needs of beginning teachers are consistent across state.

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