FORMAL AND NONFORMAL INSTRUCTION DELIVERED TO FARMERS BY ADULT INSTRUCTORS, SECONDARY AGRICULTURE TEACHERS, AND EXTENSION AGENTS

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Numerous public and private organizations and agencies conduct adult agricultural education programs. Many of the public sector programs can be traced to the Smith-Lever and Smith-Hughes Acts enacted in 1914 and 1917, respectively, that created the Cooperative Extension System and provided federal funds for vocational-technical education in agriculture. Adult agricultural education programs that emanated from these two pieces of legislation experienced steady growth through the 1970s (Phipps & Osborne, 1989, p. 475). During the 1980s, however, competition between secondary and adult programs for funds and other resources resulted in fewer adult education programs being offered by secondary vocational agriculture teachers. In addition, the number of vocational agriculture teachers available to conduct adult education programs declined from 12,510 in 1980to 11,042 in 1986 (Craig, 1988, p. 11). Since the 1960s, several states have also reduced vocational agriculture teacher contracts from 12 months to 9-10 months, thereby reducing the level of adult instruction provided by secondary programs.

Related Literature

The number of teachers who deliver adult instruction has declined even though school administrators have positive attitudes about public schools delivering adult education in agriculture (Adelaine & Foster, 1989; Miller & Krill, 1985). Not surprisingly, Adelaine and Foster (1989) found that Nebraska vocational agriculture teachers who have adult programs are more positive about secondary schools delivering adult education in agriculture than vocational agriculture teachers who do not have such programs. They also found that administrators of school systems with adult education programs tend to be more supportive than superintendents, principals, and vocational agriculture teachers without such programs (Adelaine & Foster, 1989). In terms of who should have primary responsibility for delivering adult education in agriculture, Adelaine and Foster (1989) found that 34% of the respondents preferred local secondary school systems, 23% the Cooperative Extension Service, and 20% community colleges.

From a subject matter standpoint, secondary teachers, state supervisors, and teacher educators have identified farm business management as their number one adult education priority (Burhoe & Stewart, 1983). Martin and Omer (1988) confirmed that the educational priorities of Iowa young farmers are congruent with most of the priorities of the previously mentioned agricultural educators.

Further, participants in adult education programs tend to be satisfied with the instruction. Martin and Omer (1988) found that 80% of Iowa young farmers had attended Extension meetings; over 70% were satisfied or very satisfied with the information and services received. Habeeb, Birkenholz, and Weston (1987) concluded that Missouri Extension council officers and farmers who use the Extension Service were satisfied with the information, specialists, methods, and the agricultural extension education program. When presented with a list of 12 agencies and organizations, Ohio farmers ranked meetings and clinics conducted by Extension agents first in both importance and confidence (Kramic, 1987). Adult education programs conducted by vocational agriculture teachers ranked 7th in both importance and confidence.

Problem Statement and Objectives

Adult education programs conducted by Extension agents and agriculture teachers were designed to serve different purposes. No study was identitied that compared the two systems in terms of audiences served and the content being delivered. Thus, the problem investigated in this study was: How do the two delivery systems compare in terms of the types of farmers being served, the content delivered, and the instructional methods being used? The study was designed with three objectives:

1. To determine the types of farmers being served by agricultural extension agents, full-time adult teachers, and secondary vocational agriculture teachers.

2. To determine the types of instruction being offered to farmers by agricultural extension agents, full-time adult teachers, and secondary vocational agriculture teachers.

3. To identify the types of instructional techniques that agricultural extension agents, full-time adult teachers, and secondary agriculture teachers use most often when they teach farmers.

Methods and Procedures

Three groups of agricultural educators who conducted adult programs in Ohio during the 1987-88 school year constituted the target population. This population consisted of 71 agricultural agents employed by the Ohio Cooperative Extension Service (OCES), 33 full-time adult teachers (Farm Business Planning and Analysis or FBPA teachers), and 101 secondary vocational agriculture teachers. The sampling frame was provided by the OCES personnel director and the district supervisor responsible for adult education in the Agricultural Education Service of the Ohio Department of Education. A stratified random sample of 134 agricultural educators was drawn to provide a 95% level of confidence and a 5% sampling error (Krejcie & Morgan, 1970). The sample included 47 OCES agents, 21 FBPA teachers, and 66 secondary agriculture teachers.

The researchers developed a questionnaire to collect data for the study. Four agricultural education faculty at The Ohio State University and a state supervisor of agricultural education validated the content of the instrument. A random sample of 30 agricultural educators not included in the sample was used to pilot test the questionnaire. Five subscales on the questionnaire that measured the importance of subject matter being taught had acceptable reliability (Cronbach's alpha coeffiecients ranged from .83 to .95).

The questionnaire was mailed to the sample on May 20, 1988. After four weeks, 104 agricultural educators had responded (77%). Respondents who returned the questionnaire the first two weeks of the data collection period were compared with individuals responding the last two weeks. No significant differences were observed ($p > .05$) in terms of years of adult education experience, years in present position, age, predominant type of farming in the community, highest degree earned, and employment status, i.e. whether a full or part-time adult educator.

Findings

Slightly over 40% of the OCES agents, 47% of the FBPA teachers, and 43% of the secondary vocational agriculture teachers were in the 36-45 age category. All but one Extension agent, slightly over half of the FBPA instructors, and two-thirds of the secondary teachers held at least a master's degree. Eighty percent of the FBPA teachers, 56% of the OCES agents, and 44% of the secondary teachers had been in their present positions fewer than 10 years. However, in terms of total number of years as an adult educator, 85% of the OCES agents, 66% of the FBPA teachers, and 62% of the secondary teachers had accumulated 10 or more years of professional experience. Slightly over 97% of the OCES agents, 87% of the FBPA teachers, and only 4% of the secondary vocational agriculture teachers considered themselves full-time adult educators.

Objective 1: Farm sizes in geographic areas served by OCES agents, FBPA teachers, and secondary instructors are shown in Table 1. The farms were categorized using the following Bureau of the Census (1983) standard: Small scale farm has annual gross sales under $100,000, medium scale between $100,000- $250,000 and large scale over $250,000. In 1985, the average Ohio farm was small scale because the mean gross farm income was $50,416 (Ohio Agricultural Statistics Service, 1986, p. 59). As shown in Table 1, OCES agents delivered instruction in areas where small and medium size farms predominated. FBPA teachers taught in areas where medium scale farms were most common. Secondary teachers tended to deliver instruction to farmers in areas where medium and to a lesser extent small scale farms were most common.

The adult educators were asked to describe the farmers who participated in their adult programs. They classified the farmers using the Bureau of the Census (1983) criteria: Part-time farmers were employed and worked off the farm 100 or more days during the year; full-time fanners worked off the farm fewer than 100 days. FBPA teachers tended to enroll full-time farmers in their instructional programs (71% full-time); OCES agents and secondary teachers part-time farmers (56%). Almost half (49%) of the participants in adult farmer programs conducted by secondary teachers were under age 35, 28% were 35-45, and 23% were over 46 or older. OCES agents reported that 20% of their participants were under age 35, 26% were 35-45, and 54% were 46 or older. For FBPA teachers, 21% of their participants were under age 35, 41% were 35-45, and 38% were 46 or older.

Table 1
Predominant Farm Sizes in Geographic Areas Served by OCES Agricultural Agents, Full-time Adult Instructors, and Secondary Vocational Agriculture Teachers

Predominant Farm Size	OCES (n = 38) F	%	FBPA (n = 15) F	%	Vo-Ag (n = 49) F	%	All Groups (n = 102) F	%
Small	18	41.4	2	13.3	12	24.5	32	31.4
Medium	18	47.4	12	80.0	30	61.2	60	58.8
Large	2	5.2	1	6.7	7	14.3	10	9.8
Total	38	100.0	15	100.0	49	100.0	102	100.0

Objective 2: The three groups of adult educators were asked which of five instructional areas were most important for them to deliver adult instruction for farmers. As shown in Table 2, crop and livestock production emerged as the two most important areas. Horticulture and agricultural mechanics were rated least important. A coefficient of concordance of .97 suggests that the three groups were in high agreement on the importance of the topics.

Table 2
Means, Standard Deviation s, and Rankings for Subject Matter Areas that OCES Agricultural Agents, Full-time Adult Instructors, and Secondary Vocational Agriculture Teachers Perceived Most Important for Them to Deliver to Farmers

Subject Matter Area	OCES (f = 39) M	SD	Rank	FBPA (f = 15) M	SD	Rank	Vo-Ag (f = 50) M	SD	Rank
Crop Production	4.0	.5	1	3.6	.7	0	3.8	.6	1
Livestock Production	3.9	.5	2	3.5	.8	2	3.7	.8	2
General Agriculture	3.4	.4	3	3.5	.5	2	3.3	.6	3
Horticulture	2.8	.8	4	1.7	.6	5	2.1	.8	5
Agriculture Mechanics	2.5	.7	5	2.6	1.2	4	2.9	.7	4

$W = .97, df = 4, p < .05$.

The OCES agents and FBPA teachers spent most of their contact hours during 1987-88 delivering instruction about general agriculture and livestock production (see Table 3). General agriculture included farm business management, human relations, natural resources, computers, environmental management, and other topics not classified as crops, livestock, horticulture, or mechanics. Crop production and general agriculture were the two areas in which secondary vocational agriculture teachers devoted the most contact hours while delivering instruction to farmers. However, crop production was the area in which OCES agents devoted the least contact hours. Both FBPA teachers and secondary vocational agriculture instructors devoted the least contact hours to horticultural topics.

As shown in Table 3, the secondary teachers devoted fewer hours to adult farmer instruction (mean of 15 hours per instructional area) than either the OCES agents (mean of 114 hours) or the FBPA teachers (mean of 79 hours). In addition, individuals within each adult educator group devoted a wide range of contact hours to the subject matter areas as indicated by the large standard deviations. Also shown in Table 3 are the rankings for the five subject matter areas based on the contact hours that each group devoted to the areas. A lack of agreement on the rank order for the five subject matter areas ($W = .44$, $p > .05$) indicates that the three groups devoted their contact hours to different subject matter areas.

Additional analyses were performed on these data to determine if the topics the three groups taught were the ones they perceived to be most important. Each group's importance ranking for the five subject matter areas (see Table 2) was correlated with that group's contact hour ranking for the five

subject matter areas (see Table 3). The two rankings did not agree for any of the three groups ($p > .05$, $n = 5$ for the Spearman rho coefficients). Thus, during the 1987-88 academic year, the subject matter areas that the three groups delivered for farmers were not the areas that the three groups of adult educators perceived to be most important.

Table 3
Means, Standard Deviations, and Rankines for Subject Matter Areas bv Mean Contact Hours of Adult Fanner Instruction Delivered Durine 1987-88 by OCES Agricultural Agents. FBPA Teachers, and Secondary Vocational Agriculture Instructors

Subject Matter Area	OCES (f = 39) M	SD	Rank	FBPA (f = 15) M	SD	Rank	Vo-Ag (f = 50) M	SD	Rank
General Agriculture	206.7	133.7	1	117.2	140.6	2	21.1	23.6	2
Livestock Production	186.4	186.6	2	137.0	143.0	1	14.8	18.0	4
Horticulture	96.0	124.1	3	8.6	17.5	5	4.2	9.1	5
Agriculture Mechanics	56.2	51.4	4	25.7	33.1	4	15.9	23.2	3
Crop Production	27.5	41.7	5	107.6	127.8	3	21.7	21.2	1
Mean Hours:	114.6	70.7	-	79.2	51.8	-	15.5	6.3	-

$W = .44, df = 4, p > .05$.

Objective 3: The instructional techniques the agricultural educators used in delivering instruction to farmers are presented in Table 4. Office calls, telephone calls, bulletins, and newsletters were the techniques used most often by OCES agents. FBPA teachers used on-site individualized instruction, on-farm demonstrations, telephone calls, and classroom instruction most often. The techniques secondary teachers used most often were resources persons, classroom instruction, on-site individualized instruction, and newsletters. Least used by the three groups were the mass media (radio, television, and magazines) and teleconferencing. As shown in Table 4,the three groups were in high agreement (W = .71) on how often they used the 14 instructional techniques.

Table 4
Means, Standard Deviations, and Rankings Instructional Delivery Techniques Used by OCES Agricultural Agents, FBPA Teachers, and Secondary Vocational Agriculture Teachers*

Instructional Delivery Technique	OCES (f = 33) M	SD	Rank	FBPA (f = 14) M	SD	Rank	Vo-Ag (f = 40) M	SD	Rank
Office calls	3.5	.5	1	2.5	.8	7	2.4	.8	6
Telephone calls	3.5	.5	1	3.2	.7	3	2.4	.9	6
Bulletins	3.4	.5	3	2.2	.6	7	2.6	.7	5
Newsletters	3.3	.6	4	2.7	.9	5	2.7	.9	4
Newspapers	3.1	.7	5	2.2	.7	7	2.2	.8	10
On-farm demos	3.0	.7	6	3.3	.8	2	2.4	.8	6
On-site indiv. inst.	3.0	.6	6	3.9	.2	1	2.9	.8	3
Resource persons	3.0	.7	6	2.6	.4	6	3.4	.6	1
Workshops	3.0	.6	6	2.2	.7	7	2.3	.9	9
Classroom sessions	2.9	.5	10	2.8	.6	4	3.4	.8	1
Radio	2.7	.9	11	1.6	.6	12	1.9	.8	12
Magazines	2.0	.6	12	2.0	.7	11	2.0	.8	11
Television	2.0	.9	12	1.1	.3	13	1.2	.4	13
Teleconferencing	1.5	.8	14	1.0	.o	14	1.2	.4	13

* · Means based on scale of 1 = Never Used to 4 = Usually Used.
$W = .71, df = 13, p < .05$.

Discussion

Based on contact hours devoted to the five subject matter areas, the three groups accurately described themselves as full or part-time adult educators. Compared with the Extension agents and FBPA teachers, the secondary instructors accurately described themselves as part-time adult educators. Ohio Extension agents and FBPA teachers spent similar amounts of time delivering instruction to farmers. From a subject matter standpoint, the three groups agreed on the important topics that they should deliver for Ohio farmers. However, the subject matter delivered during 1987-88 was not consistent with what they perceived as most important. The instruction the three groups delivered tended to match the Burhoe and Stewart (1983) findings about crop and livestock instruction falling between farm management and agricultural mechanics in importance.

Although the groups agreed on the ranking for the instructional techniques, there were differences in how often they used the techniques. For example, both the Extension agents and FBPA teachers tended to use individualized, nonformal techniques. Secondary teachers tended to use formal techniques, i.e. classroom sessions and resource persons. Compared with the other two groups, the Ohio Extension agents used more techniques, i.e. individualized approaches followed by printed materials and nonformal, group techniques. Martin and Omer (1988) corroborated this finding, however, they found a different importance ranking for the techniques. Iowa young farmers wanted Iowa Extension agents to use group techniques such as community and county meetings more than office and telephone conferences (Martin & Omer, 1988).

Finally, the three groups of Ohio adult educators were in high agreement on which instructional techniques they used least, i.e. radio, magazines, television, and teleconferencing. Few OCES agents and secondary teachers, and no FBPA teacher had used teleconferencing. Level of use mean scores indicate that the Extension agents used mdio and television more than the other two groups. Martin and Omer (1988) found that Iowa young farmers ranked mass media higher in importance than the Ohio Extension agents included in this study.

Conclusions

The types of farmers served and the contact hours devoted to live subject matter areas suggest that the three groups of Ohio adult educators are serving different audiences and teaching different subject matter for various periods of time. Neither the Extension agents, the FBPA teachers, nor the secondary instructors delivered the types of subject matter during 1987-88 that they perceived to be most important. Even though the three groups agreed on the rank order for the instructional techniques, the Extension agents tended to use more techniques than either the secondary or FBPA teachers.

Recommendations

Findings about (a) the types of content being delivered, (b) characteristics of farmers who participate in the instruction, and (c) the instructional techniques should be used by Extension educators and staff development personnel when they design and conduct inservice activities for professionals who deliver educational programming for farmers. Agricultural education faculty who teach communications and teaching methods courses should use the findings about the instructional techniques when designing courses and related educational experiences for students who will deliver adult farmer instruction.

Additional research is needed to determine why the three groups of adult educators did not deliver the types of instruction that they perceived to be most important. More research is also needed to examine how mass media and teleconferencing might be used more extensively by agricultural educators to deliver instruction to farmers.

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