

**Educational Resources Used and Needed by Adult/Young Farmer
Instructors: A National Assessment**

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In the 1980's many changes have occurred in business, agriculture, and education within the United States. As a nation we shifted from a long-held tradition as a net exporting country of goods and became a net importer (Rachal, 1991). The agricultural industry contributed to improving the balance of trade by exporting billions of dollars worth of goods. During this time, more than 20 million Americans employed in the food and fiber industry worked to satisfy the need for agricultural products both at home and abroad. While this is happening, American farmers face the complexity of trying to compete in a dynamic global marketing arena. In addition, there are fewer opportunities for farmers to receive systematic and organized instruction regarding new technologies in agriculture (Birkenholz and Maricle, 1991). The attitude for increased capitalization of education during this era did not keep pace with the total federal budget. Federal outlays for vocational and adult education decreased by 65 percent compared to the total budget expenditures.

A number of research studies indicate a need for adult education programs in agriculture. In a national study, Birkenholz and Maricle (1991) found widespread agreement that every agricultural education program should have an adult education component. Chizari and Taylor (1991) stated that the need for adult programs has been magnified because of advancements in technology, innovative strategies in marketing, and the need for improved farm management. Young farmers in Iowa indicated that their agricultural education needs are changing. Crop and livestock marketing and management were identified as important topics needed in extension programs (Martin and Omer, 1987). In a study conducted in the Southern region of the National Vocational Agriculture Teachers Association (NVATA), the consensus among secondary agricultural teachers was that farmers needed more farm management training and education, to use the latest farm technology (Chizari & Taylor, 1991).

If adult instruction is to continue to be a part of secondary agricultural education programs, the focus of this education must be different from what it has been in the past (Nur, Birkenholz, and Stewart, 1989). Major economic and social changes that have occurred during the last decade have altered the type of needs and interests of adults in agriculture. It is important to assess how these changes have affected the nature of adult program offerings in agricultural education. If programs are to remain viable, systematic assessments are needed to determine the programming types and needs, and to identify the methods and resources valued by clientele groups (Boyle, 1991).

Purpose and Objectives

The primary purpose of this study was to determine educational resources used and needed by young/adult farmer teachers to deliver subject matter areas in contemporary adult education. Additionally, the study sought to determine the preferences of adult/young farmer teachers relative to selected instructional resources commonly used in delivering adult/young farmer instruction. The objectives of the study were to:

Identify educational resources used and needed by adult/young farmer instructors in the areas of agricultural production, agricultural finance, and the rural-urban interface.

Determine differences between instructors' use of and need for educational resources in the areas of agricultural production, agricultural finance, and the rural-urban interface.

Identify instructional methods preferred by adult/young farmer instructors to teach farmers.

Procedure

Population and Sample

The target population for the study consisted of all adult/young farmer instructors listed in the National Young Farmer Teacher Directory (1990). A random sample of 281 teachers was selected for the study.

Instrumentation

The researchers developed an instrument to measure (1) selected characteristics of adult/young farmer instructors; (2) their use of and need for educational resources in the areas of agricultural production, agricultural finance, and rural-urban interface; and (3) their preferences for selected instructional methods to teach adults. The items in section 2 and 3 of the instrument were measured on a five-point, Likert-type scale. A panel of experts consisting of four faculty members at The Pennsylvania State University and the education committee of the National Young Farmers Association judged the instrument to have acceptable content and face validity. A post-hoc reliability analysis indicated that the instrument had acceptable reliability (Cronbach's alpha coefficients ranged from .83 to .92 for agricultural production, agricultural finance, rural-urban interface, and instructional methods section of the instrument).

Data Collection

A cover letter explaining the purposes of the study, a copy of the questionnaire, and a self-addressed prepaid return envelope were mailed to the sample. Three mailings were sent and a 70 percent response was obtained. Nonresponse error was assessed using procedures recommended by Miller and Smith (1983). No significant differences ($p > .05$) were found between early and late respondents on the key variables measured in the study.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences at The Pennsylvania State University. Frequencies, percentages, and means were used to describe the data. The paired t-test was used to determine differences between the teachers' use of and need for selected educational resources.

Findings

Of the 196 adult/young farmer instructors responding, 97 percent were male. Most teachers (81%) were married. Instructors ranged in age from 23 to 69 years with a mean of 38 years. Seventy-five percent of the instructors had children while 25 percent had no children. A majority of the instructors (59%) reported the master's degree as their highest educational level, followed by the bachelor's degree (32%). The respondents had been adult/young farmer instructors a mean of 9.3 years, and had taught agriculture a mean of 13.3 years. The mean number of farmers enrolled in their adult/young farmer programs was 34. On an average, instructors had a contract for 235 days, and devoted approximately 30 percent of their time to adult/young farmer instruction. The number of adult/young farmer instructors per program was 1.73.

Educational Resources Used and Needed by Adult/Young Farmer Instructors

Adult/young farmer instructors were asked to indicate their use (on a scale 1-5, "never" to "consistently") of educational resources in selected subject matter areas and how much they need (on a scale 1-5, "no need" to "very much need") relative to agricultural production, agricultural finance and rural-urban interface. Paired t-test analysis were conducted to determine significant differences between use and need for these educational resources. The results are found in Table 1.

Adult/young farmer instructors "usually" used educational resources for subject matter areas such as corn (3.86), followed by soybeans (3.55), beef (3.49), swine (3.47), hay and forages (3.35), and wheat (3.25). The educational resources "rarely" used were cotton (1.30) and citrus (1.10). The instructors perceived "much need" for educational resources for subject matter areas such as corn (3.93), swine (3.63), beef (3.61), hay and forages

Table 1. Means, Standard Deviations, and t-test Probabilities for Agricultural Production

Subject matter area	Need ^a		Used ^b		Mean Difference	t-value
	Mean	SD	Mean	SD		
Corn	3.92	1.08	3.88	1.09	0.04	0.75
Swine	3.63	1.04	3.47	1.13	0.16	2.92*
Beef	3.61	1.07	3.49	1.13	0.12	1.94
Soybeans	3.59	1.30	3.55	1.30	0.04	0.77
Hay & forages	3.59	1.09	3.35	1.13	0.24	4.53*
Wheat	3.42	1.15	3.25	1.17	0.17	3.42*
Oats & other grains	2.79	1.01	2.65	1.07	0.14	2.89*
Dairy	2.33	1.15	2.30	1.26	0.03	0.56
Vegetables	2.26	1.18	2.01	1.05	0.25	4.94*
Sheep	2.25	0.93	2.21	0.96	0.04	0.80
Fruits	2.01	1.07	1.84	0.98	0.17	3.13*
Horses	1.91	0.92	1.73	0.94	0.18	3.36*
Cotton	1.35	0.91	1.30	0.80	0.05	2.08*
Citrus	1.13	0.53	1.10	0.47	0.03	2.36*

^aNeed mean computed on a scale 1 (No need) to 5 (Very much need)

^bUse mean computed on a scale 1 (Never) to 5 (Consistently)

*p<.05

(3.59), soybeans (3.54), wheat (3.42), and oats and other grains (2.79). The educational resources for subject matter areas that were perceived to be of "little need" were fruits (2.01), horses (1.91), cotton (1.35) and citrus (1.13). Overall, the instructors perceived "much need" for educational resources for all the subject matter areas in the category of agricultural production than they perceived to have used.

Nine of the 14 subject matter areas in agricultural production produced significant differences between need and use (Table 1). Swine, hay and forages, wheat, oats and other grains, vegetables, fruits, horses, cotton and citrus were the subject matter areas where the instructors perceived a greater need for educational resources than what they have used. No significant differences were found between need and use ratings relative to subject matter areas such as corn, beef, soybeans, dairy, and sheep.

Adult/young farmer instructors "usually" used educational resources for subject matter areas such as marketing (3.73). The "sometimes" used educational resources for subject matter areas such as profitable decision making processes (3.46), farm business analysis (3.43), enterprise analysis (3.36), risk management (3.26), personal and family financial management (3.18), estate planning (3.01), making the farm grow (2.80, and getting into farming (2.62). Educational resources for subject matter areas such as problems with employees (2.20), getting out of farming (1.85), and decreasing the size of the farm business (1.92) were "rarely" used by the instructors.

The instructors perceived "much need" for educational resources in subject matter areas like marketing (4.38), farm business analysis and profitable decision making (4.03), enterprise analysis (3.99), risk management (3.86), personal and or family financial management (3.85), estate planning (3.65) and making the farm grow (3.54) (Table 2). Getting into farming (3.25) and problems with employees (2.99) were

Table 2. Means, Standard Deviations, and t-test Probabilities for Agricultural Finance

Subject matter area	Need ^a		Used ^b		Mean difference	t-value
	Mean	SD	Mean	SD		
Marketing	4.38	0.83	3.76	1.02	0.62	8.44*
Farm business analysis	4.03	0.90	3.43	1.03	0.60	8.80*
Profitable decision making processes	4.03	0.83	3.46	0.99	0.57	7.58*
Enterprise analysis	3.99	0.93	3.36	1.03	0.64	9.17*
Risk management	3.86	0.90	3.26	1.01	0.60	8.57*
Personal and/or family financial management	3.85	0.89	3.18	1.02	0.67	8.47*
Estate planning	3.65	0.95	3.01	1.04	0.64	7.69*
Making the farm grow	3.54	0.99	2.80	1.10	0.74	9.22*
Getting into farming	3.25	1.05	2.62	0.98	0.63	8.24*
Problems with employees	2.99	1.21	2.20	1.03	0.79	9.46*
Getting out of farming	2.41	1.13	1.85	1.00	0.56	7.83*
Decreasing the size of the farm business	2.35	1.02	1.92	0.94	0.43	7.20*

^aNeed mean computed on a scale 1 (No need) to 5 (Very much need)

^bUse mean computed on scale 1 (Never) to 5 (Consistently)

*p<.001.

perceived as "moderate need" by the instructors. Getting out of farming (2.41) and decreasing the size of the farm business (2.35) were perceived as "little need" by the instructors. Overall, the instructors perceived "much need" for educational resources in all of the topic areas within the agricultural finance category.

The need and use ratings of educational resources relative to the category of agricultural finance are shown in Table 2. All the 12 subject matter areas produced significant differences between use and need ratings with need ratings higher than use in each case. The instructors perceived "much need" for educational resources for eight of the subject matter areas within agricultural finance category.

Adult/young farmer instructors "sometimes" used educational resources relative to the following subject matter areas in the rural-urban interface category: water quality (2.93), land use (2.99), production of safe food (2.73), nutrient management (2.56), global economic impacts (2.55), and animal welfare (2.54), (Table 3). The subject matter areas for which educational resources "rarely" used were human nutrition related to production of food crops (2.20) and diverse cultures (1.94). The instructors perceived "much need" for educational resources for all the subject matter areas with the exception of animal welfare (3.40), nutrient management (3.14), human nutrition related to production of food crops (3.00), and diverse cultures (2.63) which were moderately needed by the instructors. Adult/young farmer instructors perceived "much need" for educational resources for all subject matter areas within the category of rural-urban interface greater than they perceived to have used in the past.

Table 3. Mean, Standard Deviations and t-test Probabilities for Rural-Urban Interface

Subject matter area	Need ^a		Used ^b		Mean difference	t-value
	Mean	SD	Mean	SD		
Water quality	3.91	0.91	2.93	1.09	0.98	11.12*
Land use	3.81	0.89	2.99	1.02	0.82	10.20*
Production of safe food	3.70	1.01	2.73	1.09	0.97	11.29*
Global economic impacts	3.59	1.09	2.55	1.10	1.04	11.41*
Animal welfare	3.40	1.20	2.54	1.14	0.86	9.82*
Nutrient management	3.14	1.11	2.56	1.16	0.58	7.90*
Human nutrition related to production of food crops	3.00	1.07	2.20	0.96	0.80	9.97*
Diverse cultures	2.63	1.09	1.94	0.99	0.69	9.12*

^aNeed mean computed on a scale 1 (No need) to 5 (Very much need)

^bUse mean computed on a scale 1 (Never) to 5 (Consistently)

*p<.001.

Figure 1 shows the overall "need" ratings for educational resources in the areas of agricultural production (2.94), agricultural finance (3.50) and rural/urban interface (3.37).

Instructional Resources that are Preferred by Adult/Young Farmer Instructors to Teach Farmers

The instructors were asked to indicate their preferences (on a scale 1-5, "very low preference" to "very high preference") for instructional resources they used to instruct

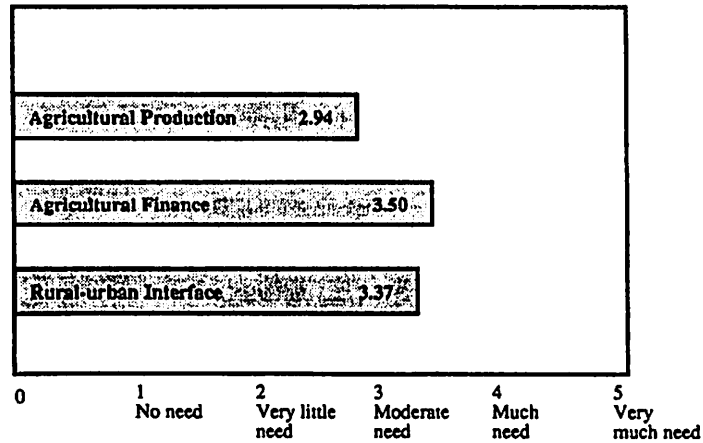


Figure 1. Overall "Need" Ratings for educational resources in Agricultural Production, Agricultural Finances and Rural-urban Interface

adult/young farmers. The results are shown in Table 4. The highly preferred instructional resource was videotapes (4.47), followed by slides (3.86), pamphlets (3.68), and overhead transparencies (3.61). The instructional resources that had a low to moderate preference were video disks (2.29), books (2.60), 16 mm motion pictures (2.60) and computer interactive videos (2.64).

Table 4. Instructional Resources Preferred by Adult/Young Farmer Instructors

Instructional resource	f	Mean	SD
Video tape	192	4.47	0.63
Slides	191	3.86	0.90
Pamphlets	191	3.68	0.86
Overhead transparencies	191	3.61	1.02
Computer interactive video	182	2.64	1.26
Books	189	2.60	1.05
16 mm motion pictures	190	2.60	1.16
Video disk	180	2.29	1.30

Scale: 1=very low preference; 2=low preference; 3=moderate preference; 4=high preference; 5= very high preference.

Conclusions and Discussion

Adult/young farmer instructors are more likely to be men, married, and nearly 38 years old. Most have advanced degrees, have taught agriculture for 13 years, and have been adult/young farmer instructors for nearly a decade. Most instructors worked full-time and devoted a third of their time to adult/young farmer instruction. This profile of adult/young farmer instructors closely matches other agricultural teachers with the possible exception of teacher gender and percent time working with adults.

Based on the results of the study it is apparent that much need exists for educational resources in a number of subject matter areas. The need for educational resources was much more pronounced for subject matter areas in agricultural finances, followed by rural-urban interface, and agricultural production.

Adult/young farmer instructors perceived "much need" for educational resources in the areas of marketing, farm business analysis, profitable decision making, enterprise analysis, risk management, personal and/or family financial management, and estate planning. Similarly, subject matter areas such as water quality, land use, production of safe food, and global economic impacts in the rural-urban interface category were "much needed" by the instructors. This finding closely matches the findings of Haynes (1984) who reported a desperate need of educational resources for these subject matter areas. Perhaps several reasons would provide insights into why there is much need for educational resources: advanced technology, innovative strategies in the era of marketing, need to improve farm and personal finances, importance given to the environment and quality of life by farmers, educators, and decision makers. In addition, changes in the agricultural laws and regulations, and changes in the international arena may have lent support to a greater need for educational resources.

In regard to agricultural production, it appears that a need exists for educational resources for a number of traditional subject matter areas (corn, soybeans, wheat, beef, and swine). Findings suggest little need for educational resources for subject matter areas like fruits, horses, cotton and citrus. This finding may be attributed to geographic limitations where instructors may have perceived "much need" or "little need" for educational resources depending on the importance and geographic location of crops.

Adult/young farmer instructors preferred videotapes, and to a lesser extent, slides to instruct adult/young farmers. Video disks, books, and 16 mm motion pictures were less preferred by the instructors.

Recommendations

This study provides new directions for educational resources and programs for adult/young farmers in the United States. The data indicate that adult education programs in agriculture should move away from traditional educational offerings. This does not mean that we should abandon production agriculture but rather we should develop programs that address the educational needs relative to farm finances. The data indicate that the need for educational resources in farm finances should help farmers to make decisions appropriate to their farm situations. Marketing, business analysis, decision making and

enterprise analysis represent subjects that are difficult for a number of teachers to comprehend and teach. In-service programs which help teachers develop the ability to transfer this information to a broader clientele should be created.

The data further suggest that programs that focus on the rural-urban interface should be developed. Obviously there is a great amount of interest for subject matter areas in the rural-urban interface category. These findings are similar to the national direction for programming in extension where water quality, land use, and food safety are major issues. The rural/urban interface provides many opportunities for the astute adult teachers of agriculture to broaden their program offerings to nontraditional audiences.

The findings suggest that there are many opportunities for adult educators to interact with business and industry. Clearly, development of materials for new program areas should lead to alliances among business, industry, production agriculture, and agricultural educators.

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