

The Identification of Instructional Priorities
for Future Programming in Adult
Education in Agriculture

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Agricultural educators have stressed the planning and delivery of instructional programs for adults for many years. These programs must address the current needs of farmers as indicated by Bender, McCormick, Woodin, Cunningham, and Wolf (1972) when they stated:

Since participation in adult education is essentially voluntary, the agricultural educator is challenged to develop programs that are relevant to today's problems in agriculture and that assist the participants in making appropriate decisions about their enterprises. (p. 9)

Specifically, information is needed concerning the technical needs of the adults in agriculture. The need was addressed by Rossman and Bunning (1978) when they said, "Scientific and technological progress requires continual updating of skills. Continuing education has become a necessity for the adult members of our society" (p. 139).

There is a need for baseline data to be utilized in the shaping of instructional programs for adults in agriculture. Although the literature reports what should be taught to adults, little research was identified which attempted to build an educational base upon which all concerned segments of the agricultural education community can draw to project a unified program development effort. Progressive and timely programs in adult education in agriculture will vary and sometimes fail to address the needs of the adults without a unified effort from the teachers, teacher educators, and supervisors.

Objectives

The primary objective of the study was to ascertain if there were differences in the way the future educational needs of adult enrollees in agriculture were viewed by the state supervisors of vocational agriculture, one teacher educator for adult programs in agriculture from each state, central region teachers of adults, Missouri teachers of adults, and Missouri secondary vocational agriculture teachers. The secondary objective of the study was to develop a prioritized list of the perceived educational needs of adults in agriculture.

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Data Sources

The design of the study was ex post facto since it was not possible to exert direct control over the independent variables. Randomly selected study samples were drawn from the Missouri secondary vocational agriculture teachers and the central region teachers of adult populations. All Missouri teachers of adults in agriculture, the head state supervisors, and one teacher educator for adult programs in agriculture from each state were also surveyed. Responses were received from 33 state supervisors for a 67% return, 37 teacher educators for an 86% return, from 45 Missouri secondary vocational agriculture teachers for a 75% return, from 34 Missouri teachers of adults in agriculture for a 97% return, and from 42 central region teachers of adults in agriculture for an 82% return. Instrumentation used consisted of the "Adult Technical Needs Form."

Methods

Instrument

The instrument was developed using a panel of experts which rank ordered the technical needs identified as important through the literature. The results were tabulated, the items rank ordered, and the top 11 items which represented instructional areas of agricultural mechanics, plant science, animal science, and farm/ranch business management were randomly arranged for the final instrument. The rankings were collapsed into the four major instructional divisions offering both a general and specific ranking of future technical needs of adults. The instrument was pilot tested prior to use for the study.

Analysis

Statistical methodology was a major part of the study because the analysis model can be applied to many types of research. The use of non-parametric procedures coupled with several check re-check procedures to insure result confidence, was instrumental in building confidence in the results of the study. Non-parametric procedures offer the researcher the option of interpreting data from populations without an established research base with 95 to 100% of the confidence found with parametric analysis (Ferguson, 1976) without having to make expansive assumptions to build confidence in the results.

The following considerations for building a statistical data base for a relatively new area of study were established after reviewing relevant statistical references (Ferguson, 1976; Steele and Torrie, 1960):

1. Check the population for a sound statistical base. If a base does not exist, consider using a non-parametric approach.

2. The instrument scaling for non-parametric procedures is less limited than for parametric procedures which must be able to reach an authentic mean. However, having an instrument with ordinal or ratio scaling does not automatically mean a parametric approach must be taken.
3. Non-parametric procedures offer a broader view of the population. The assumptions, which often are accepted too readily in parametric designs, are not critical for non-parametric procedures.
4. Non-parametric procedures offer as many statistical procedures for both independent and dependent variables as do parametric procedures.

Therefore, non-parametric procedures were selected for the analysis for this study. The data were tested to ascertain whether the five groups were drawn from among identical populations by applying the Kruskal-Wallis test for independent samples. The Wilcoxon rank sum test was applied to statements where significance was found to isolate the source of the differences among groups.

The following null hypothesis was tested at the .05 alpha level:

Ho: There is no significant difference among the ranking of Missouri secondary teachers of vocational agriculture, Missouri teachers of adults in agriculture, central region teachers of adults in agriculture, state supervisors, and teacher educators as measured by the "Adult Technical Needs Form."

Results

The data analysis failed to produce a chi-square value from the application of the Kruskal-Wallis test that could reject the null hypothesis at the .05 alpha level. Therefore, the null hypothesis was not rejected. The chi-square values and probabilities can be found in Table 1.

The final rankings of the areas for both scales were consistent among all groups. The rankings for the 11 item scale dealing with content areas were organized by the four instructional divisions and presented in Table 2. The four content areas from the Farm/Ranch Business Management division were ranked one to four by all participating groups in the study. The rankings for the items of the remaining divisions varied by groups. The final rankings were farm/ranch business management first, animal science second, plant science third, and agricultural mechanics last, as noted in Table 3.

Therefore, it was concluded that there is a consensus of opinion on the future needs of adults in agriculture among agricultural educators. Instruction in the area of farm/ranch business management was perceived to be the most critical area in the coming years.

Table 1
Results of Kruskal-Wallis Test of Data for the
"Adult Technical Needs Form"

Instrument	Chi-square ^a	df	Prob>Chi-square
Four-item	.16	4	.99
Eleven-item	.01	4	1.00

^a Chi-square (df=4)=9.49, p <.05

Discussion

The findings from the data collected on the "Adult Technical Needs Form" indicated that agricultural educators perceived the greatest need to be in the instructional area of farm/ranch business management. These programs should include instruction in financial record keeping, financial planning and analysis, financial interpretation for use in decision making, and the marketing of agricultural products.

The midwest has a large concentration of state supported teachers of adults who are involved in programs related to farm business analysis and computer-assisted record management. These individuals have a primary goal of improving the farms of their clientele by providing assistance in the development, maintenance, and analysis of farm business records which adds credence to the strong record analysis responses. As for responses to the rest of the instrument, local problems in the other technical divisions are generally handled on an individual program need basis rather than in the adult programs. This philosophy is in keeping with the scores of the "Adult Technical Needs Form."

With the exception of forage crop production and pasture management which rated very low, the technical divisions of animal science and plant science tended to fall between the farm/ranch business management and the agricultural mechanics divisions. The responses in these technical divisions varied across the groupings as to their emphasis in planning an adult program. A partial explanation for this response trend could be that the largest numbers of respondents were located in the midwest where livestock, crops, and machinery operation and repair command a higher interest than forages or pasture management.

Questions might be raised as to why the agricultural mechanics section of the "Adult Technical Needs Form" placed last overall and

Table 2
Adult Technical Needs Mean Rankings by Groups

Technical area	State supervisors Mean ^a	Rank ^b	Teacher educators Mean	Rank	Secondary teachers Mean	Rank	MO teachers of adults Mean	Rank	CR teachers of adults Mean	Rank
Farm/ranch/business/management										
Developing a financial record system	2.15	1	2.62	3	2.38	1	2.38	1	2.07	1
Interpreting financial information	2.88	3	2.54	2	3.58	3	3.88	3	3.17	3
Developing financial plans and analyses	2.82	2	2.03	1	2.76	2	2.59	2	2.38	2
Marketing agricultural products	4.48	4	4.54	4	5.31	4.5 ^c	4.15	4	4.12	4
Animal science										
Caring for and feeding livestock and poultry	7.12	7	6.41	5	5.31	4.5 ^c	5.65	5	5.64	5

^aMean is the average of the ranking by each respondent in the group, range from 1 (most important) to 11 (least important).

^bRank is based on the mean ranking of each technical area within the respondent group.

^cTie mean score, so each was given the same rank.

Table 2 (continued)

Technical area	State supervisors ^b		Teacher educators		Secondary teachers		MO teachers of adults		CR teachers of adults	
	Mean ^a	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Implementing livestock/poultry production systems	7.15	8	6.76	6	6.80	6	6.97	7	7.33	7
Plant science										
Producing forage crops and managing pastures	8.67	10	8.59	10	7.60	9	7.91	8	8.33	9
Producing cash crops	7.03	6	7.46	8	7.27	7	6.35	6	6.86	6
Agricultural mechanics										
Outfitting an agriculture shop and developing basic shop skills	7.97	9	8.38	9	8.27	10	8.56	10	9.12	10
Repairing, adjusting, and servicing agricultural machinery	6.97	5	6.84	7	7.47	8	8.21	9	7.64	8
Planning and constructing agricultural buildings	8.76	11	9.84	11	9.11	11	9.35	11	9.21	11

^aMean is the average of the ranking by each respondent in the group, range from 1 (most important) to 11 (least important).

^bRank is based on the mean ranking of each technical area within the respondent group. Tie mean score, so each was given the same rank.

Table 3
 Ranking of the Four Technical Divisions by Groups

Technical division	State supervisors ^b		Teacher educators		Secondary teachers		MO teachers of adults		CR teachers of adults	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Farm/ranch business management	1.15	1	1.03	1	1.22	1	1.21	1	1.10	1
Animal science	2.61	2	2.35	2	2.29	2	2.41	2	2.43	2
Plant science	2.91	3	3.03	3	3.04	3	2.79	3	2.86	3
Agricultural mechanics	3.06	4	3.38	4	3.29	4	3.50	4	3.50	4

^aMean is the average of the ranking by each respondent in the group.

^bRank is based on the mean ranking of related technical areas in the "Adult Technical Needs Form."

why each of the three areas in the agricultural mechanics division ranked eighth, tenth, and eleventh out of eleven areas. Possible reasons for this trend might include the fact that the instrument was designed to ascertain the future instructional needs of adults and the agricultural mechanics division of adult programs is already well established. Also, the central region of the United States is deeply involved in farm business analysis programs. In addition, the agricultural mechanics phase of modern agriculture has become so complex that less emphasis may be placed on the expansion of this area in local programs because of the high cost of updating equipment and instructors to meet the demands of industrial innovations.

The technical needs of adults in agriculture have important implications for the planning and delivery of relevant instructional programs. There are also related implications for planning the pre- and inservice preparation programs for teachers of vocational agriculture that will be working with adults.

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