

Perceptions of Northwest Vocational Agriculture Instructors
Regarding Knowledge of Microcomputers and Value of
Proposed Microcomputer Programs in Agriculture

James A. Church
Vocational Agriculture
Instructor
Castleford, Idaho

Richard M. Foster
Teacher Educator
University of Nebraska

The microcomputer has become more common in rural homes and offices as agricultural business people and educators realize the tremendous value of this electronic tool. Business people are becoming increasingly aware that not only can the microcomputer be used as an immediate decision-making aid, but entire business analysis, record keeping systems, and office management procedures can be put in place at a relatively small cost.

Agricultural educators are realizing the benefits of using microcomputer technology in the classroom, not only as a means of addressing technical agriculture subjects but also to provide students with desperately needed computer literacy (Damhof & Sieg, 1982). If one of the primary objectives of vocational agriculture is to develop occupational skills needed to enter and progress in the highly technical agricultural industry, then an understanding of the microcomputer is essential and software development in agriculture and agricultural education is crucial (Starling & Shewmaker, 1982).

Leising (1982) reported progress was being made in developing microcomputer literacy with postsecondary teachers in California Community Colleges. After surveying 45 community college agricultural departments, Leising (1982) found only 175 had access to microcomputers. He reported the single greatest need for computer-related inservice education was in the area of improving instructor computer competencies and utilizing available software.

Uthe (1982) reported that vocational educators across the country face a two-fold task. The first is that of acquiring computer literacy themselves and the second is that of training workers to use computers and computerized equipment in their jobs. Uthe (1982) further observed that future application of computer technology will be enormous. It will touch all phases of vocational education just as it will touch the lives of everyone.

Purpose

The primary purpose of this study (Church, 1982) was to identify microcomputer topics that might be of value as part of the instructional programs of secondary vocational agriculture in Idaho, Washington, and Oregon. The specific objectives were to:

1. Determine the knowledge possessed by Northwest vocational agriculture instructors regarding microcomputer usage and capability.
2. Determine the need for inservice training in microcomputer usage for Northwest vocational agriculture instructors.
3. Determine which microcomputer systems were most readily available to Northwest vocational agriculture instructors.
4. Analyze the value placed by Northwest vocational agriculture instructors on selected microcomputer topics for use in the curriculum.

Procedures

The sample of this study was 150 vocational agriculture instructors, comprised of 50 randomly selected from the three states of Idaho, Oregon, and Washington. The total number of vocational agriculture departments in Idaho, Oregon, and Washington were 75, 106, and 175 respectively. A sample of 50 from each state was used to insure an adequate sample size while maintaining approximately equal numbers for comparison purposes.

To determine if a difference existed between initial respondents and nonrespondents, 20 teachers were called and encouraged to return their survey instrument. As a result of the follow-up 12 additional responses were obtained. A t-test analysis was used to compare data obtained from the surveys returned by the deadline date with that requested from nonrespondents. No significant differences were observed on any survey items and all responses were included in the study. The overall response rate was 110 out of 150, or 73.3%.

A mailed questionnaire was used to gather data for this study. The survey was field tested by eight Idaho vocational agriculture instructors not included in the random sample. The instrument was also previewed by members of the Agricultural Computing Group in the Department of Agricultural Economics on the University of Idaho campus. All were asked to evaluate the questionnaire regarding its appropriateness, technical accuracy, and ease of understanding. The questionnaire was revised accordingly before dissemination.

The survey included four categories, each containing descriptions of possible microcomputer programs to be rated for their value when used in a vocational agriculture program. Actual programs were not reviewed. A scale from one to nine was used to determine perceived value, with "1" being no value, "5" being average value, and "9" being much value.

Additional information was collected to determine the amount of microcomputer-related inservice education received and/or needed.

Respondents were also asked to rate their general knowledge of microcomputer usage and indicate the kinds of microcomputer system most readily available to them in their high schools.

Findings

The major findings emerging from this investigation are described in the following paragraphs.

Computer Knowledge

Idaho teachers expressed a slightly less than average (4.56 on a scale of one to nine) knowledge of microcomputer usage in agriculture. Oregon and Washington teachers expressed slightly above average knowledge of microcomputer usage in agriculture (5.61 and 5.10 respectively).

Computer Availability

The microcomputers most readily available to Northwest vocational agriculture teachers were the Apple II and the Radio Shack TRS-80. It was found that 36.2% of the Idaho teachers, 64.7% of the Oregon teachers, and 36.0% of the Washington teachers had access to the Apple II system through their high school. In addition, 12.1% of the Idaho teachers, 5.9% of the Oregon teachers, and 16.0% of the Washington teachers has access to a Radio Shack system.

Inservice Education Needs

It was determined that 56.1% of Idaho teachers, 64.7% of Oregon teachers, and 40.0% of the Washington teachers had participated in inservice training about microcomputers and their application to the instructional program. When asked if additional training would be desired, 100.0% of respondents from all states expressed a need for further training.

Value of the Microcomputer Programs

Analysis was performed to identify microcomputer program topics of most potential use in the four categories of crop production, livestock production, agribusiness, and vocational agriculture administration. Proposed microcomputer programs with similar ratings from

Table 1

*Proposed Microcomputer Programs Having Above Average Value to Vocational Agriculture Teachers from Idaho, Oregon, and Washington by Agricultural Area**

Crop Production**	M SD	Livestock production	Proposed Program Topics			Vo Ag administration	M SD
			M SD	Agribusiness	M SD		
1. Financial analysis	8.38 0.88	1. Financial analysis	8.42 0.97	1. Inventory records	8.28 0.95	1. Project Cost analysis	7.37 1.64
2. Marketing crops	7.51 1.30	2. Nutrition and ration form	8.17 1.32	2. Tax records	8.20 1.17	2. Enrollment/project records	7.08 2.15
3. Crop comparison/selection	7.21 1.70	3. Performance/production evaluation	7.78 1.33	3. Reports and records	8.03 1.27	3. SOEP management	6.63 1.94
40 4. Irrigation	6.85 2.01	4. Herd management	7.33 1.71	4. Budgeting	7.90 1.34		
5. Land and equipment management	6.82 1.78	5. Breeding programs	7.30 1.74	5. Labor records	7.67 1.56		
6. Fertilizer/chemical application	6.61 2.02	6. Marketing livestock	7.15 1.80	6. Office procedures	6.71 2.31		
7. Planting/harvesting management	6.20 2.05	7. Selecting and culling	6.50 1.99				
		8. Carcass evaluation	6.10 2.23				

* Proposed microcomputer programs having composite mean ratings of 6.00 or above, using a scale of 1 to 9; 1 = No Value; 5 = Average Value; 9 = Much Value

** Topics are arranged in rank order within each category.

all respondent groups and composite mean values are presented in Table 1. Uniform agreement was observed among vocational agriculture teachers from Idaho, Oregon, and Washington on 24 of the 38 proposed program topics.

In the instructional area of crop production, it was observed that proposed microcomputer programs in financial analysis, marketing crops, and crop comparison and selection were considered as being of high value (mean ratings of 7.21 or greater) in the daily instructional program by respondents from all three states. In the area of livestock production, it was observed that proposed microcomputer programs in financial analysis and nutrition and ration formulation received value ratings above 8.17, indicating high value as part of the vocational agriculture instructional program. Data in Table 1 indicate the perceived value of microcomputer topics in agribusiness instructional areas. It was observed that programs used to provide instruction in the areas of inventory records, tax records, and reports and records were highly valued (8.28, 8.20, and 8.03 respectively). Programs observed to have potential value for providing assistance in administering vocational agriculture programs included those related to project cost analysis, enrollment and project records, and SOEP management.

Table 2 presents the top 16 program topics selected as being the most valuable by Northwest vocational agriculture instructors in the four categories of crop production, livestock production, agribusiness, and vocational agriculture administration. Each of these programs had an overall rating of 7.0 or greater.

Table 2

Microcomputer Program Topics Most Valued in the Daily Instructional Program as Perceived by Northwest Vocational Agriculture Instructors

Rank	Program	Mean
1.	Financial analysis (livestock)	8.42
2.	Financial analysis (crops)	8.38
3.	Inventory records (agribusiness)	8.28
4.	Tax records (agribusiness)	8.20
5.	Nutrition and ration formulation (livestock)	8.17
6.	Reports and records (agribusiness)	8.03
7.	Budgets (agribusiness)	7.99
8.	Performance/production evaluation (livestock)	7.78
9.	Labor records (agribusiness)	7.67
10.	Marketing (crops)	7.51
11.	Project cost analysis (vo. ag.)	7.37
12.	Herd improvement programs (livestock)	7.33
13.	Breeding programs (livestock)	7.30
14.	Crop comparison/selection (crops)	7.21
15.	Marketing (livestock)	7.15
16.	Enrollment and project records (vo. ag.)	7.08

Value determined by overall ratings of 7.0 or above. A scale value of 1 to 9 was used: 1 = no value; 5 = average value; and 9 = much value.

Summary of Findings

The major findings of this study are summarized as follows:

1. All respondents expressed average or less than average microcomputer user knowledge for agricultural areas.
2. The microcomputer system most readily available to Northwest vocational agriculture instructors was the Apple II system, followed by the Radio Shack TRS-80 system.
3. Although over half of all respondents had participated in some microcomputer inservice education, all (100%) expressed a desire for further inservice training in microcomputer applications to vocational agriculture.
4. Financial analysis programs were rated by Northwest vocational agriculture teachers as having the most potential value in daily instructional programs.
5. Budget and recordkeeping programs were rated high in value by all respondents.
6. Using a scale of 1 to 9 (1 being no value and 9 being much value), 16 of the 38 proposed types of computer programs had a composite rating of 7 or above. These programs dealt with using the microcomputer to calculate and analyze facts and figures and the storage and arrangement of information.

Recommendations

From the results of this study, it is recommended that:

1. There be an increased effort to develop microcomputer software programs in the areas of financial analysis and recordkeeping for use in the vocational agriculture instructional program.
2. An effort be made to develop microcomputer programs in agricultural areas listed in Table 2, particularly using the microcomputer systems most readily available to teachers.
3. Additional inservice training for vocational agriculture teachers be provided to enhance their knowledge of microcomputer usage in agriculture and agricultural education.
4. Additional research be conducted to assess the extent microcomputer technology is actually being used in the vocational agriculture classroom.

References

- Damhof, D., & Sieg, S., (1982). Ag students join the computer generation. *Voc Ed Magazine*, 57(3), 41-42.
- Church, J. A. (1982). *Perceptions of Northwest vocational agriculture teachers regarding knowledge of microcomputers and value of selected microcomputer programs for vocational agriculture*. Research Study, University of Idaho.
- Leising, J. G. (1982). Computers in agriculture--a program for postsecondary teachers. *Agricultural Education Magazine*, 54(7), 15-16.
- Starling, J. T., & Shewmaker, D. D. (1982). How Ohio teachers learn microcomputers. *Agricultural Education Magazine*, 54(7), 11-12.
- Uthe, E. F. (1982). The computer in our lives. *Voc Ed Magazine*, 57(3), 26-29.
-

(Gonzalez, Howell, & Lindley -- Continued from page 36)

- Findlay, E. W. *An identification of critical behavior and related major concepts relevant to the training of professional leaders in Extension Education*, (1969). Ontario, Canada: University of Guelph.
- Gonzalez, I. M. (1982). *The professional competencies needed by Extension Agents in the Pennsylvania Cooperative Extension Service*. University Park, PA: The Pennsylvania State University.
- Itulya, F. M. (1973). *Professional competencies essential for beginning Extension Agents in Arizona*. Unpublished Masters Thesis, University of Arizona.
- Price, R. (1960). *An analysis of educational needs of Arkansas Extension Agents*. Madison, WI: University of Wisconsin.
- Sappington, E. W., et. al. (1977). *Development of curriculum for professional youth workers*. Mississippi State, MS: Mississippi State University.