

Microcomputer Use in Illinois
Vocational Agriculture Programs

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For the past several years teachers have been overwhelmed with innumerable reports and inservice programs advocating the educational value of microcomputers. The importance of implementing computer technology into an educational environment is rarely questioned. Acquiring basic computer skills is critical if students are to adequately perform in a technological age (Railsback, 1983; Sheingold, Kane, & Endreweit, 1983).

Although educators have been exposed to varying amounts of information concerning microcomputers, many questions remain unanswered. How are instructors using microcomputers in the classroom? How can teachers insure equity of access to a limited number of machines? What is good software? What are the barriers to microcomputer use? How can these barriers be overcome? Where should microcomputers be located to assure integration into the curriculum? The answers to these types of questions are crucial for the effective implementation of computer technology.

Purpose and Objectives

Determining how microcomputers are being used in the classroom is a critical activity as teachers plan and implement educational programs. To adequately prepare and deliver high quality preservice and inservice microcomputer education, descriptive data are needed on the ways microcomputer technology is being implemented at the secondary level. The primary purpose of this study was to assess the current status of microcomputer use by vocational agriculture instructors in Illinois.

The specific objectives of the study were:

1. To identify the number and types of microcomputers currently being used by vocational agriculture instructors.
2. To determine the techniques for managing microcomputer use.
3. To identify the types of software currently being used by vocational agriculture instructors.
4. To identify the ways microcomputers are being used in vocational agriculture classrooms.

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5. To determine potential microcomputer inservice needs of vocational agriculture instructors.
6. To identify problems associated with microcomputer use in vocational agriculture programs.

Procedures

A descriptive study was conducted to assess microcomputer use in Illinois vocational agriculture programs. The study was designed to describe the status of microcomputer use; a cause and effect relationship between variables was not investigated.

An initial mailing to the 399 secondary vocational agriculture instructors in Illinois was conducted in November 1983. The instructors were asked if they had access to microcomputers. A self-selected sample of 172 instructors or 43% of the total number, indicated they were willing to complete the survey.

A six-part, 56 question research instrument was developed to assess microcomputer use. The instrument was an adaptation of a questionnaire developed for use with Mississippi vocational agriculture instructors (Cantrell, 1983). The different sections of the instrument dealt with demographic information, microcomputer hardware and software capabilities, instructional uses of microcomputers, training needs, and problems associated with microcomputer use. Content validity of the instrument was established by a panel of teacher educators and microcomputer curriculum specialists. Reliability coefficients (Cronbach's alpha) of .72 and .78 were calculated for the instrument.

The research instrument and a cover letter were mailed in May 1984 to the 172 instructors. Two weeks after the initial mailing of the survey, a follow-up postcard was sent to those instructors failing to return the survey.

Data were analyzed using the Statistical Package for the Social Sciences, SPSS, (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) computer program. The SPSS computer analysis resulted in the computation of means, medians, and frequencies for the individual items on the research instrument.

Results

The findings of the study were presented regarding: (a) a description of the responding instructors and schools; (b) available hardware and software; (c) the integration of microcomputer technology into the instructional program; (d) microcomputer training needs; and (e) problems associated with microcomputer use.

Description of Instructors and Schools

One hundred and twenty-one secondary vocational agriculture instructors responded to the mailed questionnaire. This response represented a 70% rate of return and accounted for 30% of the total number of Illinois vocational agriculture instructors. A follow-up of nonrespondents was conducted. This group did not differ from respondents on general demographic characteristics (e.g. age, years teaching experience, and location in Illinois). The most frequently cited reason for not returning the instrument was lack of time.

The responding instructors ranged from 23 to 64 years of age, with a mean age of 35. The number of years teaching vocational agriculture ranged from one year to 33 years, with an average of 11 years. Fourteen percent of the instructors had received a Master's degree and 37% had completed work beyond the Master's degree. All geographic sections of the state of Illinois were represented by the responding instructors.

Seventy-one percent of the responding secondary schools were located in a rural setting, 23% were located in a rural/industrialized area, and 6% were located in an urban environment. The number of students enrolled in the secondary schools ranged from 43 to 3000, with half of the schools having enrollments of less than 260 students. Fifty percent of the schools had fewer than 45 students enrolled in the vocational agriculture program. The number of students enrolled in vocational agriculture ranged from 12 to 350.

Microcomputer Hardware

Ninety percent of the responding vocational agriculture instructors had access to at least one microcomputer for classroom instruction. As illustrated in Table 1, 55% of the schools had available an Apple IIe or II+ microcomputer for instructor/student use. Twenty-eight percent of the schools used a TRS-80 Model III or IV, and 10% had a Commodore for classroom instruction. Seventy-six percent of the available machines had a printer and 5% had a modem. Memory capabilities ranged from 8K to 128K; 64K was the most frequently mentioned response.

The number of microcomputers available at each school varied from one to 25. The average number of microcomputers per school was seven. Microcomputers were located in several different areas within the school buildings, as shown in Table 1. Thirty-eight of the instructors reported that microcomputers were located in the vocational agriculture department, the most frequently reported location. In 22 of the schools, the microcomputers were placed in a separate laboratory. Forty-six schools had microcomputers located in two or more departments.

In 28% of the schools, the math instructor coordinated the use of microcomputers, in 22% the business instructor managed microcom-

Table 1

Microcomputer Hardware Available at the Schools

Variable	n
Model type	
Apple IIe or II+	67
TSR-80 III or IV	35
Commodore	13
Franklin	3
Texas Instrument	2
KAYPRO	2
NEC	2
IBM	1
	<u>125</u>
Total no. of micros per school	
1 - 5	47
6 - 10	34
11 - 15	25
16 - 20	4
21 - over	3
	<u>113</u>
Location	
Agriculture department	38
Business department	32
Media center	30
Math department	27
Computer laboratory	22
Science department	11
Main office	7
	<u>132^a</u>

Note. ^aSeveral schools had more than one type of microcomputer or had microcomputers located in more than one area, resulting in an *n* size greater than 121.

puter use, and in 12% of the schools the principal or superintendent regulated microcomputer usage. Twenty-one instructors reported that no one was assigned to coordinate the use of microcomputers at their schools.

Thirty-eight (32%) of the 121 instructors indicated that the vocational agriculture department owned a microcomputer. Three-

fourths of these machines were serviced by a company representative from which the hardware was purchased. Fifty-four percent of the computers were between one year and two years old. FFA funds were used to obtain microcomputers at 25 of the schools. Machines at 10 of the schools were financed through the general school budget or by special grant money. Two instructors reported that they had personally bought a microcomputer to use in their vocational agriculture program.

Microcomputer Software

Seventy-nine percent of the instructors indicated that they used commercial software. The software was most frequently obtained by school or departmental budgets. The average dollar amount that had been spent on commercial programs was \$550, with a range of \$10 to \$2,300 per vocational agriculture program. Software programs were most frequently purchased from Vocational Agriculture Service, University of Illinois.

One-third of the instructors had personally written computer programs for their classroom instruction. Instructor written programs included FFA reports, judging contest results, bedding plant schedules, tool inventories, grade averaging, SOE recordkeeping, and grain marketing. Ninety percent of the instructors indicated that they were willing to test new software in areas related to their instructional programs.

Instructional Uses of Microcomputers

Less than one-third of the instructors indicated their students had access to a microcomputer for the entire school day; microcomputers were available between one to four hours per day for 50% of the instructors. Although instructors and their students may have had daily access to a microcomputer, instruction was usually limited to a particular time during the school year. Twenty-three instructors reported they only used the microcomputer for a one to two week period during the entire year.

Seventy percent of the instructors taught a unit on microcomputers as a part of their vocational agriculture program. Instruction was provided in both beginning and advanced classes; over half of the instructors included microcomputer training for students enrolled in grades 9 through 12. Three-fourths of the teachers indicated their students used the microcomputer during regular class time and rarely before or after school hours. Twenty-six percent of the instructors coordinated microcomputer usage on a first come basis, 14% used a sign-up sheet, and 17% allowed students to decide among themselves.

Table 2

Instructional Uses of Microcomputers

Use	n	%
Agricultural production programs, i.e., feed rationing, insect control, marketing, cost analysis, horticulture crops.	93	77
Test scores, grading programs, class roster, or other class records.	52	43
Games, instructional and/or non-instructional.	49	41
Mailing lists and membership rosters, i.e., newsletters, alumni banquet invitations, young farmer adult classes.	39	32
Drill and practice exercises, i.e., tool ID, test or class review.	39	32
SOE records, student recordkeeping	32	26
FFA contests, tabulation, and scoring	26	22
Inventory of laboratory equipment	24	20
Other, i.e., instructor-written programs.	20	16

Table 2 illustrates how the instructors used microcomputers in their instructional program. The microcomputers were most frequently used for agricultural production programs, class recordkeeping, and instructional/non-instructional games. As shown in Table 2, instructors were using the microcomputer both for classroom instruction and for program improvement.

Training Needs

Eight percent of the instructors reported they had previously received training in the use of microcomputers. The instructors had participated in several different types of training sessions. Forty-seven percent had received training as a part of an inservice workshop, 29% in a graduate level university course, and 37% of the instructors indicated they were self taught.

Table 3

Microcomputer Training Needs

Need	Rank	\bar{X}
How to incorporate microcomputers into the vo-ag program.	1	4.4
The ways to use microcomputers for instruction.	2	4.3
What microcomputer programs are available to meet student needs.	2	4.3
How to run packaged programs for microcomputers.	3	4.2
The ability to write or modify microcomputer programs to meet program or student needs.	4	3.5
How to use other data bases or state networks.	5	3.4
How to use microcomputers as a delivery method for various size groups.	6	3.3
The different types of microcomputer equipment, capabilities and uses.	6	3.3
How to select, purchase and care for microcomputer equipment.	6	3.3
A working knowledge of microcomputer terminology.	7	3.1
How microcomputers operate.	8	2.6

Note. Means were calculated on a scale from 1 to 5, with 1 = little importance and 5 = very important.

Although over 90% of the instructors indicated a willingness to participate in microcomputer inservice programs, only 57% responded that training in the use of microcomputers was a major priority for them. As illustrated in Table 3, when asked to rate the importance of selected training needs, the instructors identified the incorporation of microcomputers into their vocational agriculture program as their

most important need. Where to locate and how to use available software also were rated as high-priority training needs. The least important inservice needs were learning how to operate microcomputers and acquiring a working knowledge of computer terminology. If involved in a training program, approximately two-thirds of the instructors preferred a one to four week structured workshop.

Problems with Microcomputer Use

The final section of the research instrument consisted of an open-ended question concerning problems associated with microcomputer use. Table 4 provides the rank order of the 10 problems identified by the instructors. Lack of funds for purchasing microcomputer hardware and software was the most frequently mentioned response, followed by scheduling conflicts and an absence of quality software.

Conclusions and Recommendations

The sample for the study was self-selected and only partially represented the total number of Illinois vocational agriculture instructors who were using microcomputers during the 1983-84 school year. Therefore, the following conclusions and recommendations are primarily based upon the 121 instructors who responded to the research instrument.

Conclusions

1. The location of microcomputers within the school building and the person responsible for coordinating microcomputer use varies considerably. These management decisions are apparently made on an individual school basis.
2. The Apple IIe and II+ are the most common types of microcomputer hardware used by the vocational agriculture instructors.
3. Although only one third of the vocational agriculture departments own a microcomputer, most of the instructors and their students have daily access to one or more computers for classroom use.
4. The apparent high cost of commercial software may be a prohibitive factor to microcomputer use for vocational agriculture departments with limited budgets.

Table 4

Rank Order of Problems Associated with Microcomputer Use

Problem	Rank	n	%
Lack of funds	1	59	49
Scheduling conflicts	2	28	23
Lack of quality software	3	18	15
Lack of knowledge and/or lack of time to learn about microcomputers	4	17	14
Inadequate number of machines	5	14	12
Lack of integration into the instructional program	6	10	8
No security for equipment	7	8	7
Lack of administrative support	8	7	6
Outdated programs and equipment	9	6	5
High time investment for limited usage	10	2	2
		<u>169</u>	<u>141</u>

Note. Instructors could list more than one problem, resulting in computations exceeding 100%.

5. Microcomputer instruction is not necessarily restricted to the higher grade levels. Both beginning and advanced students of vocational agriculture are receiving microcomputer training.
6. Instructors are using the microcomputer for instructional purposes and as a management tool (i.e., recordkeeping and grade averaging).

7. Determining how to integrate microcomputer technology into their current vocational agriculture programs is a high priority for the instructors.
8. Lack of funds for purchasing hardware and software is the major concern of the vocational agriculture instructors regarding microcomputer use.

Recommendations

1. Preservice and inservice programs in agricultural education should concentrate on how to integrate microcomputer technology into vocational agriculture programs, rather than how to operate specific pieces of equipment. Identifying instructional goals and objectives for microcomputer use should help instructors to plan and implement effective educational programs.
2. Research studies, which go beyond the collection of descriptive data, should be conducted to determine the relationship between microcomputer use and educational outcomes. Little empirical evidence exists on the role and value of microcomputers in educational settings.
3. Although funding is a local concern, information regarding the financing of microcomputer hardware and software and reviews of commercial programs should be made available to instructors. This information could be released through a statewide publication and could include summaries of how individual instructors are using microcomputers in their vocational agriculture programs.

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