and publication is stressed, this additional student contact time can become a specter appearing to block advancement through tenure and promotion. The survey also indicated that 10% of the faculty perceive the teaching environment to be a disadvantage. One cause for this attitude is that faculty must learn to teach with a certain degree of television charisma.

Many faculty (27%) recognize an increased teaching load in lecture preparation time. The new and creative limitations of the system force the instructor to reevaluate traditional and conventional teaching methods, and to reorganize course material and lecture delivery in a more succinct manner. Since television is such a pervasive medium in society today, we have come to expect certain levels of quality from the television screen. This could be the reason why instructors feel pressure to redesign course material and improve delivery. Perhaps they are trying to live up to television role models.

The survey revealed that administrators (20%) were least concerned about any disadvantage the system might have. The highest factor they considered as a disadvantage (28%) was a lack of willingness on the part of faculty to teach over the system. However, as indicated earlier, administrators are currently naive regarding the situation which their faculty are coping with in using the system. Administrators, however, are aware of an increased load on staff (15%) and technician (8%) time, and also on equipment cost (8%) which reflects in an increase in the overall cost of the course (15%). A disadvantage that a few administrators did see (4%) was the discrepancy in calculating total student contact hours per faculty. As mentioned earlier, this presents a "catch twenty-two" for faculty and administrators alike.

Conclusions

There is no doubt that the Information Age has taken hold of most levels of society. Educators, administrators and legislators need to come to grips with this fact and begin to alter their perceptions and use of the many powerful communication tools which are available on the market. In the recent past where the typewriter, the telephone, the camera and the xerox machine formed the basis for university communication, there are now more sophisticated sources to be tapped such as the microcomputer, video cameras and telecommunications.

By increasing the use of ITV systems, for example, students will find many benefits and opportunities in education which can reflect in the overall improvement of the knowledge base of the general public. In the United States where distances play a significant factor in the dissemination of knowledge, ITV and programmed instruction as well as the use of telecommunications for research and community service could offer long range benefits to the public.

Educators and administrators need to clarify some of the misconceptions surrounding the difficulties of using this teaching medium. Educators need to be supported by their administrators and encouraged to use the creative potential of the system. Interaction should occur on the system during a normal class session. Legislators can appropriate more funds towards the improvement of system hardware which would ease using this sometimes strange form of communication and offer opportunities through competitive grants in instructional program development. Given support, encouragement and increased creative endeavors to provide teaching, research and community service through ITV systems, the university would once again move into the forefront as a leader and a disseminator of knowledge.

References

Hawkridge, David. *New Information Technology in Education.* The Johns Hopkins University Press, Baltimore, MD 1983.

Heinich, R., M. Molenda, and J. Russell. *Instructional Media and the New Technologies of Instruction,* John Wiley and Sons, New York, 1982.

Machlup, F. *Knowledge and Knowledge Production,* Princeton University Press, Princeton, NJ 1980.

O'Bryan, Kenneth G. *Writing for Instructional Television.* Corporation of Public Broadcasting, Washington, DC 1981.

Ritacco, Michael. "Developing a Telecommunications System," *Times Higher Education Journal,* May 1985.

CASE STUDY

Teaching Faculty - Staff Integrated Software

Fred W. Reneau and Kevin Tatham

Caldwell and Marshall (1982) defined staff development as "an activity or set of activities designed to enhance an institution through the promotion of the personal/professional growth of the administrative and/or instructional staff of that institution" (p. 26). Lawrence (1982) interpreted staff development as the totality of educational and personal experiences which contribute toward an individual's being more competent and satisfied in an assigned professional role. Inservice education is one of the several functions of staff development. McMeen (1984) stated: "In the area of faculty development, particularly in working with faculty to increase their utilization of an important resource in the classroom that a great challenge exists" (p. 25).

Educators can justify the use of a microcomputer through their everyday routines. Computers are useful for maintaining student and course records (Camp, 1983). University agriculture instructors and faculty should strive to become computer literate since microcomputers are applicable in most agricultural businesses. As a result, university and extension

Reneau is professor and Tathan is researcher in the Department of Agricultural Education & Mechanization, Southern Illinois University, Carbondale, IL 62901.

personnel should be providing microcomputing in-service education and instructional materials as a normal part of staff development.

According to Tauber (1984), "Inservice training should focus on the packaged software rather than on detailed programming concepts and skills" (p. 9). Properly selected software provides for almost immediate use of the microcomputer as a tool. Integrated software has multiple functions and is capable of performing word processing, creating electronic spreadsheet templates and data bases, designing graphs and accessing other computers through the use of telecommunications. "Integrated software is available to perform several extremely useful functions. The educator is a knowledge worker and as such can greatly benefit from word processing for easier text entry and manipulation. Data management and spreadsheet software can assist in the creation, manipulation, storage and retrieval of important information such as student grades, attendance and schedules. In addition, although not a major stress, drill/practice software can aid in making the instructional process more individualized, effective and efficient" (Tauber, 1984, p. 10).

The design of faculty computer application workshops can consequently, take into account the needs, interests, skills, and abilities of its participants. To be responsive to the needs of different teachers interested in computing, Carrier et al (1985) developed a two level approach to the inservice workshops. The self instructed lessons included a step by step format of the information to be learned by the participants.

Problem Statement

The purpose of the study was to conduct a microcomputer inservice seminar for selected faculty and staff using an integrated software package. The seminar considered two basic questions. What curriculum content should be used for integrated software inservice instruction, and was the self instructed method of presentation effective for learning an integrated software package?

Research Questions

1. What components are necessary in the integrated software curriculum for faculty and staff inservice instruction?
2. What integrated software commands and terms were designated by the faculty and staff as essential?
3. Was the self instructed method of presentation effective for learning an intergrated software package?

Methodology

Study Population

The study was limited to 15 faculty and staff members at Southern Illinois University, Carbondale. The number of participants were limited because there were 15 IBM-PC computers and 15 copies of the integrated software package. Participants from the School of Agriculture represented Agribusiness Economics, Agricultural Education and Mechanization, Animal Industries, Plant and Soil Sciences, Forestry and International Agriculture. Of the 15 participants, ten were faculty and five were staff.

Instrument Design

The curriculum materials were composed of terminology sheets, informational sheets, activity sheets, assignment sheets and a seminar evaluation sheet. The terms used came from the *Symphony Reference Manual* (Lotus Corporation, 1981). The informational sheets provided a step-by-step description of how to carry out the software commands as well as how to complete the in-lab activities. The activity, assignment sheets, and curriculum content developed for the "AGEM 418" course (Microcomputing in Agricultural Education), (Reneau and Legacy, 1984), were revised to fit the faculty/staff inservice education format. The evaluation form was designed and developed by the researcher and reviewed by non-participants in the study who were familiar with the integrated software package.

Validity and Reliability

The integrated software applications course content had been taught in previous semesters to undergraduate and graduate students using a self instructed, step-by-step approach supplemented by terminology, informational, activity and assignment sheets.

According to Kerlinger (1973), "Synonyms for reliability are: dependability, stability, consistency, predictability and accuracy" (p. 42). The "AGEM 418" course objectives and course content, which had been used over a period of two years, established the consistency and the dependability of the curriculum with regard to achieving those qualities of reliability. The course contents' accuracy was determined through the students' understanding and their ability to meet the course objectives. Through observations of student grades earned over the two year period, it was apparent that the objectives were being met, thus making the course content stable and dependable.

Procedures

An information letter and a registration form were sent to each member of the faculty and staff employed in the School of Agriculture one month before the inservice seminar. The first 15 applicants to register were used as the study population. The inservice seminar consisted of five sessions; each session was two hours. The learning guides contained the terms, information sheets, activity sheets and assignments sheets and were distributed during the first session. The instructor gave a short lecture on the equipment operation and the components of integrated software. The lab exercise included self instructed step-by-step sheets, describing how to execute each of the commands and functions required in completing the sessions. A question and answer session was conducted

at the end of each seminar session to clarify any ambiguities. Evaluation sheets were given to the participants after each seminar session.

Data Analysis

The introductory information about the topics was calculated using a percentage of response and a mean of response. If two-thirds (ten) of the participants checked a term or command, then it was essential. The cutoff point of two-thirds or 66 percent of the population was determined by adding one standard deviation to the population mean. The population mean was 7.5 and one standard deviation was 2.3 for a total of 9.8. The 9.8 total was then divided by the population number to get the cutoff percentage of 66. The third part of the evaluation instrument was analyzed by a percentage of response and summarized how the participants felt about the seminar as a whole. The final part of the evaluation was an open ended question which allowed the participants to voice their opinions on the seminar content and structure.

Results

Integrated Software Components

Research Question 1. What components are necessary in the integrated software curriculum for faculty and staff inservice instruction?

A percentage of response was calculated on the topic areas for each work environment to determine how the participants felt about the information supplied. A mean score of 4.5 and above were recorded for the terminology information. Over eighty percent of the participants indicated that the lecture instruction information was necessary and over sixty percent felt that the information supplied about the lab activities was adequate enough to complete the lab exercises (Table 1).

Essential Terminology and Commands

Research Question 2. What integrated software commands and terms were designated by the faculty and staff as essential?

Any term or command that two thirds (ten) of the participants checked was essential. The terms were broken down into the five work environment categories: spreadsheet, word processing, graphics, data base and communications. A total of 90 terms and 111 commands were given. Of the terms give, 71 (79%) were determined essential (Table 2). Of the commands given, 58 or (52%) were determined essential (Table 3).

Self Instructed Method

Research Question 3. Was the self instructed method of presentation effective for learning an integrated software package?

All faculty and staff participants indicated the informational sheets were useful in understanding and completing the exercises. Over ninety-three percent indicated that the informational sheets which defined the terms, commands and functions, helped foster understanding of the lab activities. All participants felt that the Terminology Sheets supplied were useful, but designated only seventy-nine percent of the terms and fifty-two percent of the commands as essential. Over seventy-five percent of the faculty and staff felt that the

Table 1. Rating of An Integrated Software Package Components by Faculty and Staff

Components	Component Rating Expressed as a Percent 1	2	3	4	5	Mean
Spreadsheet						
Integrated Package Components	0	6.7	6.7	20	66.7	4.5
Integrated Terminology	0	0	6.7	53.3	40	4.5
Equipment Terminology	0	0	6.7	53.3	40	4.3
Equipment Operation	0	0	20	26.7	53.3	4.3
Laboratory Hardware	0	0	13.3	46.7	40	4.3
Spreadsheet Templates	0	0	6.7	33.3	60	4.7
Spreadsheet Commands	0	0	6.7	20	73.3	4.7
Lab Activities	0	0	0	26.7	73.3	4.7
Practice Assignments	6.7	0	0	40	53.3	4.3
Lecture Instruction	0	0	0	6.7	93.3	4.9
Word Processing						
Word Processing Terminology	0	6.7	0	33.3	60	4.5
Word Processing Function Keys	0	6.7	0	26.7	66.7	4.5
Word Processing Special Keys	0	6.7	0	33.3	60	4.5
Word Processing Concepts	0	6.7	0	20	73.3	4.6
Word Processing Commands	0	6.7	0	20	73.3	4.5
Lab Activities	0	6.7	0	26.7	66.7	4.6
Practice Assignments	0	6.7	0	40	53.3	4.4
Lecture Instruction	0	0	0	20	80	4.8
Graphics						
Graphics Terminology	0	0	0	13.3	86.7	4.9
Definition of Graph types	0	0	0	13.3	86.7	4.9
Setting Up Bar and X-Y Graphs	0	0	6.7	6.7	86.7	4.1
Printing Out Graphs	0	0	6.7	6.7	86.7	4.1
Graph Commands	0	0	0	20	80	4.8
Lab Activities	0	0	0	26.7	73.3	4.7
Practice Assignments	0	0	0	20	80	4.8
Lecture Instruction	0	0	6.7	6.7	86.7	4.5
Data Base						
Data Base Terminology	0	6.7	0	29	73.3	4.6
Definition of Data Base Areas	0	6.7	0	20	73.3	4.6
Sorting a Data Base	0	0	13.3	13.3	73.3	4.6
Querying a Data Base	0	0	13.3	6.7	80	4.7
Data Base Statistical Function	0	6.7	6.7	20	66.7	4.4
Data Base Commands	0	0	6.7	20	73.3	4.7
Lab Activities	0	0	0	26.6	73.3	4.7
Practice Assignments	0	0	0	26.7	73.3	4.7
Lecture Instruction	0	0	0	13.3	86.7	4.9

Components	Component Rating Expressed as a Percent 1	2	3	4	5	Mean
Communications						
Communications Terminology	0	0	6.7	13.3	80	4.7
Communications Equipment	0	0	6.7	13.3	80	4.7
Integrated Communications	0	0	26.7	26.7	46.7	4.2
Communication Protocol	0	0	26.7	26.7	46.7	4.2
Communication Commands	0	0	6.7	46.7	46.7	4.4
Lab Activities	0	0	6.7	6.7	60	4.8
Lecture Instruction	0	0	6.7	6.7	86.7	4.8

NOTE: A rating of five indicates the information supplied was clear, concise and to the point.

A rating of one indicates that no information was supplied about the topic.

Table 2. Rating of Essential Integrated Software Terms by Faculty and Staff

	Essential Symphony Terms	Population Response
Spreadsheet Terms	Electronic Spreahsheet	--10--
	Range	--10--
	Cell Address	--10--
	Cell Pointer	--11--
	Column	--13--
	Row	--12--
	Formula	--11--
	Value	--13--
	Function Keys	--11--
	Menu	--10--
	Global Settings	--13--
Equipment Terms	Computer	--10--
	Keyboard	--10--
	Diskette	--12--
	Data Disk	--11--
	D.O.S. Disk	--13--
	Formatting	--12--
Word Processing Terms	Word Processing	--13--
	Word Map	--13--
	Document	--12--
	Margins	--10--
	Tabs	--10--
	Justification	--15--
	Overstrike Mode	--10--
	Insert Mode	--15--
	Cursor	--10--
	Home	--14--
Graph Terms	Graph	--10--
	X-Y Graph	--11--
	X-Range	--14--
	X-F Ranges	--14--
	Stacked Bar Graph	--10--
	X-AXIS	--12--
	Y-AXIS	--12--
Print-Graph Terms	Print-Graph Program	--12--
	Font	--11--
	Graphs Director	--11--
	Image-Select	--10--
Data Base Terms	Data Base	--12--
	Field	--12--
	Field Title	--12--
	Record	--10--
	Query	--12--
	Sort	--11--
	Criterion Range	--13--
	Find (Query)	--10--
	Selection Criterion	--11--
	Extract (Query)	--13--
	Output Range	--10--
	Data Base Range	--12--
	Date Base Statistical Functions	--12--
Communications	Data Communications	--10--
	Telecommunications	--10--
	Dedicated Line	--13--
	Modem	--14--
	Acoustic Coupler	--14--
	Gandalf Box	--14--
	Baud Rate	--14--
	Logon (Login)	--13--
	On-Line	--11--
	Asynchronous Communications	--10--

* Note: A term was considered essential when two thirds of the population or ten participants checked the term.

Table 3. Rating of Essential Integrated Software Commands by Faculty and Staff

	Essential Commands	Population Response
SHEET Commands:	Copy	--13--
	Move	--11--
	Format	--13--
	Erase	--11--
	Insert	--11--
	Delete	--11--
	Width	--14--
	Settings	--10--
Service Commands	Window	--13--
	File	--13--
	Print	--12--
	Settings	--12--
	File Retrieve	--14--
	File Save	--13--
	Window	--11--
DOC Commands	Copy	--13--
	Move	--14--
	Format	--15--
	Erase	--12--
	Search	--11--
	Replace	--13--
	Page	--10--
	Justify	--15--
	Quit	--13--
Service Commands	File	--15--
	Print	--15--
	Settings	--13--
	Exit	--10--
Word Processing Commands	End & Up Arrow	--14--
	End & Down Arrow	--14--
	End & Left Arrow	--15--
	End & Right Arrow	--15--
	CTRL & Left Arrow	--12--
	CTRL & Right Arrow	--13--
	End & Home	--13--
	Backspace	--13--
	F5 (GOTO)	--10--
Graph Commands	Image-Save	--14--
	Legend	--12--
	Titles	--13--
	Grid	--10--
	Graph-Preview	--13--
	Color	--10--
	1st Settings	--14--
	2nd Settings	--13--
	Type	--12--
Service Commands	File	--10--
	Print	--10--
	Settings	--10--
Database Commands	Query	--13--
	Sort-Keys	--12--
	Record-Sort	--11--
	Criterion Range	--11--
	Data Base Range	--12--
	Output Range	--11--
	Extract	--10--
	Settings	--11--
Service Commands	File	--10--
	Print	--10--
	Settings	--10--
Communications Commands	Settings	--13--
	Terminal	--12--
	Echo	--13--

* Note: A command was considered essential when two thirds of the population or ten participants checked the term.

lab exercises could not have been completed without any lecture. Ninety-seven percent of the participants believed the lab activities demonstrated the capabilities of the integrated software package (Table 4).

Table 4. Seminar Effectiveness as Rated by the Faculty

Percentage (%)	Electronic Spreadsheet	Word Processing	Staff Graphics	Data Base	Telecommunications
The TERMS were useful in understanding & completing the lab exercises.	100	100	100	100	100
The INFORMATION SHEETS were useful in understanding & completing the exercises.	100	100	100	100	100
The TASK STEPS were clearly explained and stated.	100	86.7	93.3	100	100
The ACTIVITIES were achievable in the allocated time.	86.7	86.7	86.7	93.3	100
The COMMANDS were accurately stated in the INFORMATION SHEETS.	100	93.3	100	100	100
The LAB ACTIVITIES were related to the TERMINOLOGY & INFORMATION SHEETS.	100	100	100	100	100
The COMMANDS, FUNCTIONS & TERMS used in the exercises were previously defined or illustrated in the INFORMATION SHEETS.	100	93.3	100	93.3	100
The LAB ACTIVITIES used the COMMANDS and FUNCTIONS effectively.	100	86.7	100	100	100
The LAB ACTIVITIES demonstrated the capabilities of Symphony.	93.3	100	100	100	93.3
The exercises could have been completed without any LECTURE	13.7	—	13.3	6.7	6.7
* The supplemental LECTURE is necessary.	80	100	80	80	73.3
The INSTRUCTOR spoke clearly and understandably.	100	100	100	100	100
This EVALUATION FORM adequately evaluates the Sumphony session.	100	86.7	86.7	86.7	93.3

The participants who were unable to attend the scheduled group session

Conclusions

Based on the data collected, the following conclusions were drawn:

1. The information supplied was useful in understanding and completing the computing applications exercises.
2. The commands, terms and functions were effective.
3. The informational sheets which defined and illustrated the terms, commands and functions, helped to foster understanding of the lab activities.
4. The tasks and activities were clearly stated and achievable in the allocated time; however, many felt more time should be allotted for work on practice assignments and individual projects.
5. The terminology sheets supplied were useful in completing the exercises; however, the participants did not find all of the terms essential.
6. The lab exercises could not have been completed without the lecture.

Recommendations

1. Include a "command tree reference" in the informational sheets for the frequently used commands and the specific task of each function key used in the different work environments.
2. Increase the lab time during each session to support greater comprehension of the lab exercise and practice assignments.
3. Provide a comprehensive project assignment to each participant so they can utilize the commands and functions learned in a practical situation.
4. Conduct additional research on the Terminology to determine whether the essential terms selected by the first group of faculty and staff would differ significantly from a different group of faculty and staff.
5. Continue the lecture instruction offered during the lab sessions; especially, for the participants who are not familiar with the microcomputer or integrated software.

References

Caldwell, S. & Marshall, J. (1982). "Staff Development - Four Approaches Described, Assessed for Practitioner, Theoretician." *NASSP Bulletin, 66*(451), 24-35.

Camp, W. (1983). "Microcomputers: A "Byte" of the Action." *The Agricultural Education Magazine," 55*(7), 13-14.

Carrier, C., Glenn, A., & Sales, G. (1985). "A Two Level Program for Training Teachers to Use Computers in the Classroom." *Educational Technology, 21*(1), 7.

Kerlinger, F. (1973). *Foundations of Behavioral Research.* (rev. ed). New York: Holt, Rinehart & Winston, Inc.

Lotus, Corporation. (1981). *Symphony Reference Manual.*

McMeen, George R. (1984). "Developing Computer Literacy Workshops for College Faculty." *Educational Technology, 24*(4), 25-29.

Reneau, F. & Legacy, J. (1984). "AGEM 418 Microcomputing in Agriculture Education Course Syllabus." Southern Illinois University, Carbondale.

Tauber, R. (1985). "Microcomputers in the Classroom: What Are the Elements of Inservice Workshops for Teachers?" *NASSP Bulletin,* (480), 9-14.