puters for both instructional and management tasks in poultry science. Specific instructional uses may include drill and practice, instructional gaming, instructional management and support, problem solving and research, simulation, test construction and analysis, and tutorial instruction (Hilgenfeld, 1981). The potential impact, in our considered opinion and judgment, on poultry science instruction and research of the unparalleled technological development of computers is unique in our history and vital to our future.

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One Teacher's Experience

A Computerized Grade Book

Robert O. Burton Jr.

For many faculty members, teaching is a stimulating and rewarding activity. But one monotonous activity associated with teaching is the recording and averaging of students' grades.

In response to this necessary but tedious chore, I used a microcomputer and spreadsheet software as a grade book. Two desires motivated this project: the desire to find a better way to record and average grades, and the desire to learn to use spreadsheet software. This paper shares the results of the experience.

Since recording and averaging of grades is an obvious application of spreadsheet software which has been used by other faculty, this is not a new idea. But at a time when computer literacy of agricultural students is a major concern, there is a need to identify and discuss useful applications which may be used to improve the computer literacy of faculty. Therefore, this paper is oriented to faculty who wish to learn how to use spreadsheet software and are therefore seeking a simple but useful application.

Spreadsheet Software

Stimulated by the observation that a calculator, pencil, and paper are used in solving many computational problems, computer programmers have developed spreadsheet software which takes advantage of the capabilities of microcomputers (Fylstra and Kling). A spreadsheet, also called an "electronic worksheet," is organized as a network of rows and columns. When names have been assigned to these rows and columns, coordinates may be used to specify the location of alphabetic or numerical information stored on the worksheet. Since the information is electronically stored, it may be retrieved for further uses, such as numerical calculations. Several different spreadsheet software programs are available for use on several different microcomputers. Potential purchasers of spreadsheet software should be aware that different combinations of software and hardware do not all have the same capabilities (McMullen and McMullen).

Summary of Application

I used spreadsheet software called VisiCalc®, with an APPLE® II PLUS microcomputer[1]. I had limited previous knowledge of spreadsheet software but had worked with mainframe computers and had taken a non-credit introductory course about microcomputers. The time required to learn the software was minimized by requesting help from people who were experienced in the use of VisiCalc. Additional knowledge was obtained by using the VisiCalc manual's index, experimenting, and asking further questions.

The grade book's design is explained in general terms since details, such as specific command sequences, may be different for different versions of spreadsheet software. One class had 65 students enrolled and 7 scores on which the final grade was based; another had 20 students and 10 scores. The grade book was originally set up as a traditional grade book is, with the first column containing students' names and each successive column containing scores. Then the average, high, and low scores were displayed at the bottom of each column. As new scores were recorded, a revised worksheet (or grade book) was stored as a file on a floppy disk. Because of fear of possible errors which might result in loss of the computerized grades, a copy of the grade book was printed each time a significant change was made. An example grade book is shown in Appendix 1.

At the end of the semester, the final numerical averages were automatically calculated and stored in a column to the right of the previously stored scores, letter grades were recorded in a column to the right of the final numerical averages, and the column of names was moved to the column at the left of the final numerical grade for ease in reading when transferring the final grades to official university record forms. The final

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[1]Apple and VisiCalc are registered trademarks of Apple Computer, Inc. and VisiCorp™, respectively.

grade book was then printed, and so a copy was stored on both disk and paper. See Appendix 2 for an example of a completed grade book.

Discussion

Potential users of spreadsheet software should be aware of some of the costs of learning. Two types of start-up time are required. First, although spreadsheet software is easy to use, learning to use the computer requires time. The time required may be reduced substantially by consultations with a person who is knowledgeable about microcomputers and spreadsheet software, and by previous computer experience. The second type of start-up time is the time required to load the spreadsheet software and previously stored grade book into the computer so that new information may be entered (approximately 2 minutes for the large class, hardware, and version of spreadsheet software used in this case). In addition, printing updated grade books takes time[2].

The standard size of microcomputer screens and computer paper may not fit the desired size of the grade book; e.g., the microcomputer screen may display twenty lines and class size may be thirty. Standard-size computer paper may be more awkward to handle than the traditional grade book is. There are several ways to overcome or adapt to these types of size problems, but such problems may be frustrating to the new spreadsheet user.

A final source of learning costs is that the spreadsheet grade book is vulnerable to human error. As with any type of information handling, there is the potential for inaccurate data entry. But unique to computers are problems which might occur, resulting in the loss of hours of work: occasionally work might be lost because of hardware failure, but more often losses occur because of mistakes made by computer users. The potential for losing information may be minimized by keeping a duplicate copy of stored information.

But use of spreadsheet software has many advantages. Spreadsheet software is conceptually simple and easy to use. Recording information on an electronic worksheet by typing it into a computer is not conceptually different from recording information by writing it on a piece of paper. It is easy to grasp the idea of specification of desired calculations using formulas based on coordinates and symbols which represent arithmetic operations. While difficulties may be encountered when performing more complex chores, the simple, repetitive task of recording and averaging grades is easy. And it can be accomplished by using a small number of spreadsheet software commands.

Another advantage of spreadsheet software is that information stored can be retrieved. Because of the computer's storage capability, it is easy to retrieve an old grade book, update it, and print a clean copy of the updated grade book. Moreover, as long as scores and formulas have been entered correctly, resulting averages will be accurate. Possibilities for additional calculations based on stored information (e.g. standard deviations) abound.

But the most dramatic benefit of storage is related to the speed with which final grades may be calculated. When grades are recorded on paper, final grades are usually calculated by punching grades and appropriate weights into a calculator to compute a weighted average. Because scores stored on a computer may be retrieved and used in an algebraic formula, the user's task in calculating grades is simplified. The user first specifies the formula used to calculate the final grade for the first student. Then this formula is replicated in the appropriate locations for the remaining students. The result is that final grades may be calculated almost instantaneously.

Of course, similar advantages may be available from software written in a computer programming language. Such software, however, would not have the

[2]Peripheral equipment exists which is much faster than the equipment used.

APPENDIX 1. Example Grade Book

NAME	GRADE 1	GRADE 2	FINAL
BLOCK	88	92	
CARVER	75	77	
DUCK	75	82	
ERSCHEMEI	92	70	
HENDERSON	55	87	
JONES	62	80	
LONEY	85	75	
PHILLIPS	48	69	
SMITH	81	72	
TOLBERT	100	96	
HIGH	100	96	
LOW	48	69	
AVERAGE	76.1	80	

APPENDIX 2. Grade Book With Final Grades

GRADE 1	GRADE 2	NAME	FINAL	
88	92	BLOCK	90	B
75	77	CARVER	76	C
75	82	DUCK	78.5	C
92	70	ERSCHEMEI	81	B
55	87	HENDERSON	71	C
62	80	JONES	71	C
85	75	LONEY	80	C
48	69	PHILLIPS	58.5	F
81	72	SMITH	76.5	C
100	96	TOLBERT	98	A
100	96	HIGH	98	
48	69	LOW	58.5	
76.1	80	AVERAGE	78.05	

capabilities for other applications that spreadsheet software has.

Conclusions

I plan to use a microcomputer and spreadsheet software as a grade book in the future. Having learned to use spreadsheet software, I feel that a spreadsheet software grade book is better than a traditional grade book.

The spreadsheet gradebook provided a simple application through which to learn how to use microcomputer spreadsheets. Since learning to use the spreadsheet as a gradebook I have had occasion to use spreadsheet software in two demonstrations to farmer-oriented audiences and in the preparation of a research paper.

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Student and Professional Assessment Of Instructional Slide-Tape Modules

Robert C. Sorensen and
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Introduction

Needs of individual students are often not completely met by the instruction procedures designed for the whole class. Several types of techniques have been used to enrich the learning experience such as out-of-class projects (2), autotutorial systems (3), extra work options (4), bonus problems (5), and independent research projects (6). Of these, some are successful and some have no effect (7).

Although most enrichment activities are developed to expand the primary course material, students also have a need to broaden their knowledge in topics only peripherally related to the course, but which they may not experience elsewhere in their educational program. The project described here was developed to examine the characteristics and reliability of student evaluation of one of these types of enrichment activities.

This report: (a) describes an enrichment procedure using slide-tape modules, (b) presents and characterizes student ratings of the modules, and (c) compares the student ratings with those of three professional evaluators.

Procedures

The introductory soil science course (approximately 250 students) utilizes lectures, laboratories, and recitations. Six slide tape modules (described in Table 1) were offered to students to fulfill one of 10 lecture grades (8% of the course grade). With each module was a question sheet to be filled out and later scored. A score of 70 or above on each question sheet gave the student full credit for the module. The composite score (expressed as a percentage) given for the module exercise depended on the number of modules completed: none, 0%; 1, 40%; 2, 60%; 3, 80%; 4, 90%; 5, 100%; 6, 110%. This plan was designed to encourage completion of some of the modules, but make penalties slight if not all modules were completed.

The importance of media quality has been indicated by Bathurst (1) and others. For this exercise, commercially prepared slides with written scripts were purchased.[1] The script and slide-advancing pulses were placed on to a cassette tape using a Wollensak 2570 recorder. Students used two types of Singer Caramate projectors to hear and see the presentations. Five of the modules were narrated by the major course instructor and one by a student with a major in broadcasting. Lengths of the programs are given in Table 1.

For each module the student was given an evaluation sheet on which he or she was asked to rate the presentation on seven points — slide quality, narration quality, organization, interest, vocabulary, and length. For the first four qualities a scale of 4-excellent, 3-good, 2-fair and 1-poor, was used. For the last 2 qualities a 3-point scale was used, 2 being about right, 3 being too short or easy and 1 being too long or hard. No information on the interpretation of these scales was given to the students. The modules were rated on the same basis by the three professionals. These persons included the Audiovisual Specialist in Agricultural Engineering, the Agricultural Communications and Media Specialist for the College of Agriculture (the second author of this paper), and the Extension Specialist for Visual Aids in the College of Agriculture.

Results

More than 95% of the students used all slide-tape modules. In general, the class responded positively to the use of the modules. Of a sample of 189 students, 26% felt they got a considerable amount of information, 56% thought they had gotten some information, 15% saw no benefits and 3% were not sure what benefit they had received.

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