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.

References

Fylstra, Dan and Bill Kling. *VisiCalc Instantly Calculating "Electronic Worksheet."* User's Guide for the APPLE II & II PLUS. Software Arts, Inc. 1981.

McMullen, Barbara E. and John F. "The Super Spreadsheets: How Do They Compare?" *Popular Computing.* June 1983.

Student and Professional Assessment Of Instructional Slide-Tape Modules

Robert C. Sorensen and
Myra S. Wilhite

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.

Sorensen is a professor of Agronomy and M.S. Wilhite is an instructional media specialist for the College of Agriculture, University of Nebraska, Lincoln, NE 68583

Table 1. Subject, Source and Attributes of the Six Slide-Tape Modules.

Name	Supplier[1]	Run Time (Minutes)	No. of slides	No. of uses
1. Subsidence	JLR	11	29	220
2. San Andreas Fault	JLR	35	51	167
3. Recycling	JLR	17	50	208
4. Potassium Production	PPI	12	38	196
5. High Intensity Agriculture	JLR	17	51	192
6. Tissue Testing and Field Diagnosis	PPI	19	52	150

[1]JLR - James L. Ruhle and Associates
PPI - Potash and Phosphate Institute

Ratings given by students and professionals are in Table 2. In almost every case, students rated the modules more highly than the professionals. They also were not able to discriminate among the modules regarding slide quality, narration quality, and organization except on Module 3. This module was narrated by a stranger to the students and the pace was much more rapid than for the other five modules.

Slide quality and organization were perceived as slightly better by the students than the professionals. A much greater difference occurred for the narration quality. In general students rated this aspect as good, whereas the professionals rated it only fair. It is not clear whether this difference relates to content, delivery, or both. Comments from the professionals indicated both were involved. However, the delivery was similar in five of the tapes. Therefore, the variability in professional ratings seems to indicate that students did not observe differences in content. For Module 6, the two ratings of narration are particularly far apart. On this module the text was very simple, and according to the professionals, delivery was monotonous. However, the same comments were presented for Module 2.

Table 2. Summary of Student and Professional Rating of Six Slide Tape Modules.

Quality		Slide-tape (Table 1) 1	2	3	4	5	6	Ave.	t[1]
Slides[2]	Student	3.4	3.4	3.4	3.3	3.5	3.5	3.4	5.68
	Professional	2.7	2.3	2.7	3.0	3.0	3.0	2.8	
Narration[2]	Student	3.2	3.1	2.4	3.1	3.2	3.2	3.0	8.40
	Professional	2.0	1.7	1.7	1.7	1.7	1.3	1.7	
Organization[2]	Student	3.2	3.1	3.0	3.2	3.2	3.2	3.1	2.04
	Professional	2.5	3.0	2.7	3.0	2.7	2.7	2.8	
Interest[2]	Student	3.0	3.3	3.1	2.7	3.3	3.2	3.1	—
Vocabulary[3]	Student	2.0	2.0	1.9	2.0	2.0	2.1	2.0	2.24
	Professional	2.0	1.3	1.5	2.0	1.7	2.0	1.8	
Length[3]	Student	2.1	1.7	1.9	2.0	1.7	2.1	1.9	3.74
	Professional	2.0	1.0	1.0	1.7	1.3	1.0	1.3	

[1]Calculated values of t for two averages. Probabilities: 10%, 1.79; 5%, 2.20; 1%, 3.10.
[2]4-Excellent, 3-Good, 2-Fair, 1-Poor
[3]3-Too easy (short), 2-About right, 1-Too hard (long)

Evidently, the professionals perceived some differences the students missed.

The students found Module 6, Potassium Production to be less interesting than the other modules. There is a suggestion that the interest level was related to the degree of application of the subject matter to agriculture, but Model 2, which has limited agricultural applications, was also rated high.

Although there was some relationship between playing time and perceived module length, some differences were evident. Students were comfortable with times up to 20 minutes, and there is evidence that some students considered the 19-minute module, Module 6, to be too short since the average rating was greater than 2.0. Both students and professionals agreed that the 27-minute and 35-minute modules were too long and both perceived the 19-minute module as shorter (higher numeric rating) than the 17-minute module. The rapid pace of the 17-minute module, Recycling, evidently made it appear longer than it was.

Conclusions

On the basis of this study, the following conclusions are proposed:

1. Students, in general, rate slide-tape modules higher than professionals.
2. Greater differences exist between the ratings of students and professionals for the narrative than other quality measured.
3. Interest of students in modules is related somewhat to the extent of application of the topic to agriculture, but exceptions existed.
4. Factors other than playing time affect the length of modules perceived by both students and professionals.

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Literature Cited

1. Bathurst, Leonard H. 1975. Enhancing Educational Quality through the Use of Media. *NACTA J.* XXIX(3): 36-38.
2. Briggs, George B. 1980. Individualization of Instruction through Out-of-Class Project Design. *NACTA J.* XXIV(4): 23-24.
3. Burger, A.W., J.C. Everly, and J. C. Steele, 1971. Multidimensional Approaches in Autotutorial Teaching of the Crop Science Laboratory. *Agron J.* 63:144-146.
4. Kelly, James. 1980. An Extra Work Option in College Courses. *NACTA J.* XXIV(2): 30-31.

5. Larson, K.L., C.J. Nelson, and W.J. Russell. 1973. Use of the Weekly Bonus Problem in Audiotutorial Teaching of Introductory Plant Sciences. *J. Agron. Educ.* 2: 56-59.
6. Nelson, C.J., K.L. Larson, and S.W. Ehler. 1973. Value of an independent Research Project in an Introductory Plant Science Course. *J. Agron.* Educ. 2:50-55.
7. Smith, Ronald C., Philip C. Kozel, and J. Robert Warmbrod. 1975. Does Laboratory Reinforcement Result in Greater Learning? *NACTA J.* XIX(1): 22-23.

Academic Background And Student Performance In Beginning Crop Science

A. W. Burger and
R. D. Seif

Abstract

Colleges and universities rely on American College Test (ACT) scores and High School Percentile Rank (HSPR) in screening students for academic and scholastic successes in college work.

This study was conducted to (a) determine whether students with high ACT scores, high High School Percentile Rankings (HSPR), and high cumulative college grade point averages (CPGA's) were earning the highest crop science course grades, and (b) to find out whether there was any association between HSPR, ACT, gender, college major, and CGPA for Beginning Crop Science students.

Final course letter grades of 199 students enrolled in the introductory crop science classes during the Fall of 1981 and the Spring of 1982 were related to composite ACT scores, high school percentile rank, cumulative grade point average, college major, gender, and college class.

Seniors earn fewer A grades than other classes. Fewer males than females rank in the 90-99 high school percentile group. A higher component of enrollees with high HSPR's compared to those with low rank: (a) scored higher in the American College Test, (b) earned more "A" grades, and (c) earned high cumulative grade point averages. More enrollees with superior cumulative grade point averages (a) scored higher in ACT and (b) earned more "A" grades than those with low CGPA's. More enrollees with superior ACT scores earned "A" grades than those with low ACT scores. The student's major had no significant effect on academic performance.

The high school percentile rank, ACT score, and college cumulative grade point averages of enrollees are good predictors of scholastic success in introductory crop science student performance. The credibility and reliability of the use of ACT scores and HSPR in determining success in college introductory crop science course work are upheld and sustained.

Burger is a professor of Agronomy and Seif is a professor of Biometry-Agronomy in the Department of Agronomy, University of Illinois, Urbana, Illinois.

Introduction

Many factors and attributes affect student performance in almost any endeavor. However, do students with better academic backgrounds do better academically in a beginning crop science course? Higher achieving students were more receptive to a weekly bonus exercise in the audiotutorial teaching of introductory plant science at the University of Missouri (3). Brown et al (1) found that low achieving students have an activity delay much greater than do high achieving students, i.e., they have a lack of decisiveness of action, and perhaps an unwillingness to conform to academic requirements, routine, and regulation. Malo (4) related student background to course performance in introductory soil science. Other studies found that personal attributes and background helped determine academic performance of students (Burger and Seif (2), McKeachie (5), Schowengerdt (6), and Stevens and Herberger (7). The objectives of this study were to: (a) determine whether students with high ACT scores, high HSPR (high school percentile rank), and high CGPA's (cumulative grade point averages) were earning the highest crop science course grades and (b) find out whether there was any association between college class, gender, and college major and course achievement in the beginning crop science course at the University of Illinois.

Materials and Methods

The introductory crop science course at the University of Illinois is a 4-credit hour semester course composed of three lectures and one 2-hour laboratory each week. The course is required for agronomy students and several other majors in the College of Agriculture. Although it is a course for freshmen and sophomores, a large number (over 40%) of juniors and seniors enroll each semester. The course is taught each fall and spring with an enrollment of about one hundred students per semester.

Final course letter grades (A=5; B=4; C=3; D=1 and E=0) of 199 students enrolled in the Fall and Spring semesters of 1981 and 1982 were related to composite ACT scores, high school percentile rank (HSPR), cumulative college grade point average (CGPA), college major (agronomy vs. others), gender, and college class (freshmen, sophomores, juniors, and seniors).

The ACT scores, HSPR's and CGPA's (A=5) were obtained from student records in the office of the associate dean of the College of Agriculture. The data were analyzed by Chi Square statistics computed to test the independence or association of final course letter