Using SAS As A Gradebook

Donald M. Johnson

Introduction

Of all the college administrative and management tasks performed by classroom agriculture teachers, recording and calculating student grades is one of the most tedious and time consuming chores. This is especially true in large classes with several graded assignments. In such a situation, the traditional method of recording and averaging student grades (e.g. use of gradebook and calculator) is especially cumbersome.

According to Baker and Creel (1985, p. 23) "The use of a computer to assist in storage and calculation of student grades can greatly simplify the process." Several software programs have been suggested for use in managing student grades. Wood (1990) reviewed commercial gradebook programs, while Burton (1983) discussed the use of spreadsheets in academic record keeping. Other authors have reported on user written gradebook programs (Baker and Creel, 1985; Patterson and Reneau, 1985).

An alternative method of managing student academic records is the use of SAS[1] software as a computerized gradebook. According to the *SAS Introductory Guide for Personal Computers, Release 6.03* (SAS Institute, 1988)

> The SAS System is a software system for data analysis and report writing. With base SAS soft-

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[1] SAS is a registered trademark of the SAS Institute Inc., Cary, North Carolina.

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has much of an impact on the relative performance of students on exams. This should be reassuring to instructors who primarily base student course grades on student scores on exams. This also suggests that there are factors possibly more important than test length that instructors should be concerned about in constructing tests, such as clarity and content validity. Our results do not address the question of whether the relative performance of students on written examinations would be consistent with their relative performance on nonexamination type evaluation instruments. We leave this issue to further research.

References

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Marotz, Craig and Douglas Young. (1988). "Time Spent Writing Exam Answers as a Factor Related to Final Course Grade," *NACTA Journal*, 32(1):16-18.

Ostle, Bernard and Richard Mensing. (1975). *Statistics in Research*, 3rd edition, Ames, Iowa: Iowa State University Press.

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ware you can store data values and retrieve them, modify data, compute simple statistics, and create reports all in one SAS session. Other SAS software provides graphics, forecasting, data entry, and sophisticated statistics (p.3).

These capabilities make SAS an excellent alternative to other less powerful grade management software programs.

Purpose

Many college agriculture teachers already use SAS to analyze research data. However, some many not realize that SAS can also be easily used to manage student academic records. Therefore, the purpose of this article is to provide an example of how SAS can be used to record, analyze, and report student grades.

Example

The use of SAS in student grade management will be illustrated by applying it to an introductory agricultural communications course, ACO 3203, taught by the author. In this example, a series of SAS statement will be used to manage course records for five students (Table 1). The output to be produced includes a student grade summary, a measure of the relationship between the number of absences and final course percentage, and an assignment summary.

SAS statements

The SAS statements in Figure 1 were used to record, analyze, and report student grades for ACO 3203. In this example the data (student names, scores, and absences) and SAS statements were both entered into the same file. However, separate data and SAS statement files can be established and then brought together using an "infile" statement. This practice may be desirable with large classes or if a teacher is responsible for a multiple sectioned course.

SAS output

The summary of student scores is presented in Figure 2. This output can be used to determine final course grades. Similar summaries can be produced throughout the semester to provide feedback on course performance.

Figures 3 and 4 present the relationship between student absences and final course percentage. Figure 3 presents this information numerically; Figure 4 presents it graphically.

Table 1. Student Academic Records for ACO 3203.

Student	Absences	#1	#2	#3	#4
		Assignment*			
Andrews	2	90	85	100	180
Baker	0	100	90	91	192
Jones	4	60	80	82	170
Smith	3	84	80	82	164
Young	1	100	90	68	100

*Note. #1=business letter, #2=news article; #3=technical report; and #4=final examination

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Figure 1. SAS Program and Student Data File.

```
DATA GRADES;
INPUT STUDENT S ABSENCES ASSIGN1 ASSIGN2 ASSIGN3 EXAM;
TOTPTS=ASSIGN1+ASSIGN2+ASSIGN3+EXAM;
PERCENT=TOTPTS/500;
LABEL ASSIGN1='BUSINESS LETTER' ASSIGN2='NEWS ARTICLE'
ASSIGN3='TECHNICAL REPORT' EXAM='FINAL EXAMINATION'
TOTPTS='TOTAL POINTS EARNED'
PERCENT='PERCENT OF TOTAL POINTS EARNED';
CARDS;
ANDREWS   2    90   85   100   180
BAKER     0   100   90    91   192
JONES     4    60   80    82   172
SMITH     3    84   80    82   164
YOUNG     1   100   90    68   200
RUN;
PROC SORT;
BY STUDENT;
PROC PRINT LABEL NOOBS;
VAR ABSENCES ASSIGN1 ASSIGN2 ASSIGN3 EXAM TOTPTS PERCENT;
BY STUDENT;
TITLE1 'ACO 3203';
TITLE2 'STUDENT COURSE SUMMARY';
TITLE3 'SPRING SEMESTER 1990';
RUN;
PROC CORR NOSIMPLE;
VAR ABSENCES PERCENT;
TITLE 'RELATIONSHIP BETWEEN NUMBER FOR ABSENCES';
TITLE2 'AND FINAL COURSE PERCENTAGE OF ACO 3203';
RUN;
PROC PLOT;
PLOT ABSENCES*PERCENT='*';
RUN;
PROC MEANS;
VAR ASSIGN1 ASSIGN2 ASSIGN3 EXAM PERCENT;
TITLE 'DESCRIPTIVE STATISTICS FOR COURSE';
TITLE2 'ACO 3203--SPRING SEMESTER 1990';
RUN;
```

The ability to conduct in-depth analyses of course records is a major advantage of using SAS as a gradebook. For example, the information in Figures 3 and 4 might indicate a need to develop strategies to promote class attendance since class attendance and final course percentage are so highly correlated.

A summary of total class achievement on each of the four assignments and on the course as a whole is presented in Figure 5. This information could be used to evaluate and revise course content, instructional methods, or individual course assignments.

Summary

This article has shown one example of how SAS can be used as a gradebook program. The use of SAS in this manner has two major advantages over other gradebook options. First, many college agriculture teachers currently use SAS to analyze research data; therefore, SAS is a familiar tool which can be easily adopted for use in grade management. Second, since SAS is such a powerful data analysis package, teachers can conduct in-depth analyses of student course performance. The information gained from such analyses can then be used for course revision and improvement.

The use of SAS software is an efficient, effective method of managing student grades. Hopefully, this article will serve to stimulate the use of a familiar tool in a new way.

References

Baker, G. & Creel, B. (1985). A computerized interactive gradebook. *NACTA Journal*, 29 (3), 23-26.

Burton, R.O., Jr. (1983). Use of a microcomputer and spreadsheet software as a gradebook. *NACTA Journal*, 28 (3), 31.

Patterson, R.J. & Reneau, F.W. (1985). Utilizing a microcomputer grade

Figure 2. Summary of Student Grades.

ACO 3203 FINAL COURSE GRADES SPRING SEMESTER 1990

--------------------- STUDENT=ANDREWS ---------------------

ABSENCES	BUSINESS LETTER	NEWS ARTICLE	TECHNICAL REPORT	FINAL EXAMINATION	TOTAL POINTS EARNED	PERCENT OF TOTAL POINTS EARNED
2	90	85	100	180	455	0.91

--------------------- STUDENT=BAKER ---------------------

ABSENCES	BUSINESS LETTER	NEWS ARTICLE	TECHNICAL REPORT	FINAL EXAMINATION	TOTAL POINTS EARNED	PERCENT OF TOTAL POINTS EARNED
0	100	90	91	192	473	0.946

--------------------- STUDENT=JONES ---------------------

ABSENCES	BUSINESS LETTER	NEWS ARTICLE	TECHNICAL REPORT	FINAL EXAMINATION	TOTAL POINTS EARNED	PERCENT OF TOTAL POINTS EARNED
4	60	80	82	172	394	0.788

--------------------- STUDENT=SMITH ---------------------

ABSENCES	BUSINESS LETTER	NEWS ARTICLE	TECHNICAL REPORT	FINAL EXAMINATION	TOTAL POINTS EARNED	PERCENT OF TOTAL POINTS EARNED
3	84	80	82	164	410	0.82

--------------------- STUDENT=YOUNG ---------------------

ABSENCES	BUSINESS LETTER	NEWS ARTICLE	TECHNICAL REPORT	FINAL EXAMINATION	TOTAL POINTS EARNED	PERCENT OF TOTAL POINTS EARNED
1	100	90	68	200	458	0.916

record keeping program to forecast course scores. *NACTA Journal*, 29 (3), 19-23.

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Wood, J.A. (1990). Software sampler: Electronic gradebook programs. *The Agricultural Education Magazine*, 62 (10), 8,16.

Figure 3. Correlation Output - Numerical.

Relationship Between Number Of Absences
And Final Course Percentage For Aco 3203

Correlation Analysis

Pearson Correlation Coefficients / Prob :R: under Ho: Rho=0 / N=5

	Absences	Percent
Absences	1.00000	-0.95695
	0.0	0.0107
Percent	-0.95695	1.00000
Percent Of Total Points Earned	0.0107	0.0

Figure 4. Correlation Output - Graphic.

Relationship Between Number of Absences and Final Course Percentage for ACO 3203

Plot of Absences*Percent. Symbol used is '*'

ABSENCES

```
    4 +           •

    3 +                •

    2 +                               •

    1 +                                    •

    0 +                                           •
      ----+---------+---------+--------+---------+
        0.75      0.80      0.85     0.90      0.95
              Percent of Total Points Earned
```
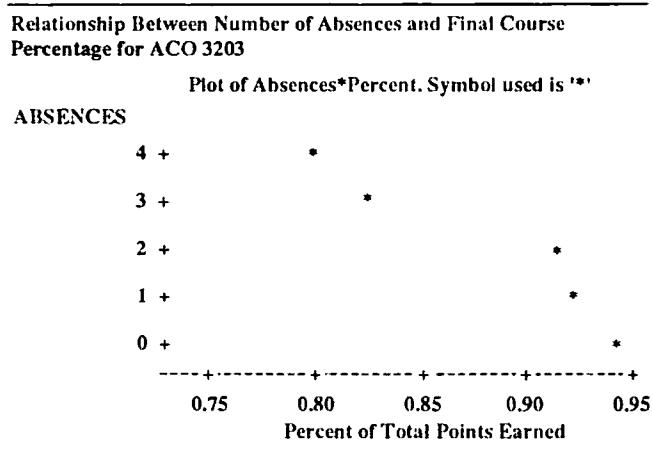
Figure 5. Course Assignment Summary.

Descriptive Statistics For Course
ACO 3203--Spring Semester 1990

N Obs	Variable	Label	N	Minimum	Maximum
5	Assign1	Business Letter	5	60.0000000	100.0000000
	Assign2	News Article	5	80.0000000	90.0000000
	Assign3	Technical Report	5	68.0000000	100.0000000
	Exam	Final Examination	5	164.0000000	200.0000000
	Percent	Percent Of Total Points Earned	5	0.7880000	0.9460000

N Obs	Variable	Label	Mean	Std Dev
5	Assign1	Business Letter	86.8000000	16.4681511
	Assign2	News Article	85.0000000	5.0000000
	Assign3	Technical Report	84.6000000	11.9079805
	Exam	Final Examination	181.6000000	14.5876660
	Percent	Percent Of Total Points Earned	0.8760000	0.0680735

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Writing and Information Seeking Skills Developed By Multipurpose Tasks

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Abstract

This study describes the use of assignments which incorporated the use of writing skills, information seeking skills, and specific course information. Current topics in general and agricultural economics were used. Incorporation of utilization of new information technology is described. Results of student surveys show a positive attitudinal response to the assignments. The writing and information seeking activities were also ranked as positive.

Introduction

Writing assignments offer opportunities to achieve many educational objectives (1,8). For ten years short (1-2 page) article summaries and analyses have been used to bring contemporary and current economic issues into general and agricultural economics courses. In the past six years, the faculty of the Agricultural Technical Institute has increased the emphasis on writing across the curriculum (4) in both the general and technical courses offered.[1] In addition, instruction in information seeking skills has been incorporated into the curriculum. Each time students are sent to libraries to investigate and report on course related topics offers opportunities to build library research skills and to encourage students to read with comprehension, evaluate the assigned readings, and report on the topic in clear, written prose. These are skills at higher levels of cognition than simply memorizing facts or doing math computations (5). Such skills can and should be taught in freshman level courses.

Topics

Because a text on economic principles can not cover current events, another approach to studying contemporary economic issues is needed. Five article summaries on various economic topics are required at biweekly intervals. These topics are chosen to represent major economic problems or issues facing U.S. society. These can be changed with the national economic times. Inflation and the role of the Federal Reserve in managing money supply and interest

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[1] This was accomplished in our associate degree programs under the leadership of Linda Houston, associate professor of Communications Skills.