

March 1986

Course Evaluation Based On Course Objectives

R. Kirby Barrick and Jacquelyn P. Deeds

Introduction

Evaluation of a course should not be limited to evaluation of the instructor, instructional method and content. Serious consideration needs to be given to course assignments and how closely aligned the assignments are to course goals and objectives (Popham & Baker, 1970). "Student learning assessments provide feedback to teachers about areas of instruction that need further emphasis. Student learning assessments help insure quality control of instruction over a period of time" (Wentling, 1979, p. 238). How closely course grades are associated with completion of the objectives should be an important question for all teachers.

The emphasis in student assessment should reflect the content determined by the objectives of the course. "The importance of clearly defined objectives for the evaluative process cannot be overstressed. It is axiomatic, of course, that evaluation can be done only with respect to the objectives that are to be achieved" (Morse & Wingo, 1969, p. 481). Course assignments, as well, should be tied to course objectives that are developed and identified before the inception of a course. After the course is conceived in terms of objectives or outcomes, two questions need to be considered. How can teachers access those objectives through the evaluation of students? How do teachers make sure the factors that contribute to a student's grade reflect the goals of instruction and not factors extraneous to these goals?

In an attempt to answer the above questions for Agricultural Education 290, Communication of Agricultural Concepts, at The Ohio State University, student assessment information on nearly 900 students was analyzed. The analysis included demographic data, individual assignment and test grades and their relationship to the student's final grade in the course and the importance of each assignment to the student's final grade.

Background Information

Agricultural Education 290, Communication of Agricultural Concepts, is a service course for the College of Agriculture offered by the Department of Agricultural Education. AGR EDUC 290 is designed to teach procedures and practices in developing, interpreting and communicating concepts about agriculture and natural resources. The course emphasis is the use of visual materials and effective presentations.

Barrick is with the Department of Agricultural Education, Ohio State University, 2120 Fyffe Road, Columbus, OH 43210-1099. Deeds is on the staff of Mississippi State University in Agricultural and Extension Education.

Major Course Objectives

1. Describing the importance and the applications of the communication process in agricultural business, industry and education.
2. Analyzing and interpreting agricultural concepts and research data.
3. Organizing effective presentations using audio and/or visual communication techniques as well as using the related equipment for various audiences.
4. Performing effective presentations with the appropriate communication techniques and hardware for specific audiences.
5. Evaluating the productivity and efficiency of presentations and of their related components.
6. Demonstrating greater proficiency in interpersonal and group communication techniques.

The final grade in AGR EDUC 290 is determined by the percent of total points on a straight scale.

Course Assignments

1. Communication Strategy Plan — 25 points related to objectives 1, 3 and 4.
2. Speech with Visual Aid — 50 points related to objectives 1, 2, 3 and 4.
3. Midterm Exam — 100 points related to all objectives.
4. Audio-Visual Labs — 30 points related to objectives 3 and 4.
5. Self-Evaluation — 10 points related to objec. 5.
6. One Major or Two Minor Projects — 150 points related to objectives 1, 2, 3, 4, 5 and 6. Major and minor assignments were selected by the students based on individual needs and interests. Assignments could include writing a news story or journal article, doing demonstrations, illustrated talks or persuasive speeches, photo practicum or developing slide-sound presentations.
7. In-Class Assignments — 40 points related to various objectives, depending on assignments. Assignments are completed during class time and cannot be made up if the student misses the class.
8. Final Exam — 100 points relating to all objectives.

A total of 505 points is possible in the course. While the course has been taught for over 12 years, the data included in this investigation were taken only from student records from Autumn Quarter 1981 through Spring Quarter 1984. A total of 893 students completed the course during that time and were included in the sample for this study. Demographic variables studied included student major, quarter enrolled in the course, class rank and whether the student was enrolled in the morning or afternoon section.

Results of Demographic Variables

The results indicated that there was no significant relationship between most of the demographic factors and the student's grade in the course. Table 1 shows the relationships between selected factors and final grades in AGR EDUC 290. Of the factors studied, only quarter enrolled was significantly related to final grade at the .05 level, and then at a low level of relationship.

Table 1. Relationship Between Demographic Variables and the Final Grade in AGR EDUC 290.

Variable	Correlation with Final Grade
Student Major	.10
Quarter Enrolled in AGR EDUC 290	.14 ^a
Class Rank	-.03
Class Section	.13

^a Significant at the .05 level.

Table 2 shows the mean grade in AGR EDUC 290 by student major, indicating no significant difference in final grade between student major groups.

Table 2. Table of Means: Grade in AGR EDUC 290 by Student Major.

Major	n	Mean	Standard Deviation
Agriculture	714	2.80	.77
Natural Resources	73	2.65	.99
Other	99	2.73	.81
Agricultural Communications	7	2.95	.53
Total	893	2.78	.79

Analysis of Variance

Source	df	SS	MS	F	F prob.
Between groups	3	2.03	.675	1.07	.36
Within groups	889	559.59	.630		
Total	892	561.62			

Table 3. Table of Means: Grade in AGR EDUC 290 by Quarter Enrolled

Quarter	n	Mean	Standard Deviation
Summer	25	2.46	.86
Autumn	287	2.79	.74
Winter	331	2.90	.74
Spring	251	2.62	.88
Total	894	2.78	.79

Analysis of Variance

Source	df	SS	MS	F	F prob.
Between groups	3	11.55	3.85	6.22	.0004
Within groups	890	551.24	.62		
Total	893	562.79			

Note: A significant difference existed in means between Winter Quarter and Spring Quarter using the Scheffe Post-hoc Analysis.

The table of means comparing grade in AGR EDUC 290 by quarter enrolled and the analysis of variance table (Table 3) indicate that a significant difference existed in mean grade between Winter Quarter students and Spring Quarter students with Winter Quarter students having higher mean grades. There was no significant difference in grade in AGR EDUC 290 between any other pairs of groups.

Although the ANOVA does not indicate a significant difference between class rank groups, it is interesting to note that seniors taking AGR EDUC 290 achieved a 2.66 average while all other classes were 2.80 or above (See Table 4). Students designated as Agr 7 are usually students enrolled in the honors program.

Table 4. Table of Means: Grade in AGR EDUC 290 and Class Rank

Rank	n	Mean	Standard Deviation
Freshman	155	2.80	.80
Sophomore	306	2.85	.69
Junior	206	2.80	.75
Senior	213	2.66	.96
Agr 7	8	2.93	.65
Total	888	2.78	.79

Analysis of Variance

Source	df	SS	MS	F	F prob.
Between groups	4	4.94	1.24	1.97	.097
Within groups	883	554.11	.63		
Total	887	559.05			

A significant difference in final grade between the morning sections and afternoon sections is indicated in Table 5. Students enrolled in the afternoon sections of AGR EDUC 290 had significantly higher average mean grades than the morning sections at the .05 level.

Table 5. Table of Means: Grade in AGR EDUC 290 and Class Section

Section	n	Mean	Standard Deviation
AM Section	505	2.73	.79
PM Section	389	2.85	.81
Total	893	2.78	.79

Analysis of Variance

Source	df	SS	MS	F	F prob.
Between groups	1	3.44	3.44	5.48	0.195
Within groups	892	559.35	.63		
Total	893	562.78			

Multiple regression analysis of the student data indicates that the largest portion of the variance in the student's grade is attributed to the student's grade on the Major Project, accounting for .41 of the variance. In-Class Assignments accounted for the second highest portion of variance at .22 (see Table 6).

Table 6. Regression of Grade in AGR EDUC 290 on Course Assignment Scores

Course Assignment Scores Entered Stepwise in Equation	R	R ²	R ² Change	F*
Major/Minor Projects	.6431	.4136	.4136	596.70
In-Class Assignments	.7932	.6292	.2156	717.01
Final Examination	.8734	.7628	.1336	904.58
Midterm Examination	.9070	.8227	.0599	977.78
Speech with Visual	.9292	.8635	.0408	1065.04
Strategy Plan	.9365	.8769	.0134	998.88
Audio-Visual Labs	.9144	.8857	.0088	929.70
Self-Evaluation	.9419	.8872	.0015	824.58

*p < .001.

Implications of the Study

The data indicate that the selected demographic variables of the student were not significantly related to the student's final grade in AGR EDUC 290. With the exception of quarter enrolled, none of the variables were significantly related to final grade at the .05 level. The explanation of why Spring Quarter grades are significantly lower than Winter may be that students, generally, achieve lower grades in all courses Spring Quarter, based upon information provided by the college office.

The multiple regression table indicates that the Major Project is the most important item in determining students' final grades. This is to be expected since the Major Project carries the most points toward the final score (150 of 505). The differences in point values of assignments may account for much of the differences in variance in final grade.

An interesting finding was that the 50 points of In-Class Assignments was the second most important factor in determining the student's course grade. This finding reinforces an old belief: students who attend class do better in the course. In-Class Assignments were developed to help meet course objectives; however, attendance was not an objective of the course. Therefore, it would be possible to criticize In-Class Assignments as a major factor in determining a student's final grade.

Assignments that address all the objectives (Major Project, Final Exam, Midterm Exam) contribute more to variance in the final grade than assignments that address only one or two objectives. However, an assignment that does not contribute much to the variance in final grade may still be important, especially if it is the only assignment that addresses a particular course objective.

The dilemma of whether or not to grade on attendance (measured by In-Class Assignments in this study) remains open to debate. If further analysis indicates a high correlation between In-Class Assignments and other assignments, then In-Class Assignments may not be needed. Such information may show that class attendance is associated with all assignments.

Assignments that contribute to the student's final grade which truly evaluate student mastery of the course objectives should be the goal of all teachers. An effort must be made to determine if the weight given the factors that determine the final course grade are closely aligned with content that is considered important by the teacher. This study provides an approach to such course evaluation.

Literature Cited

- Morse, W.C., & Wingo, G.M. 1969. *Psychology and teaching*. Glenview, IL: Scott, Foresman & Co.
- Popham, W.J., & Baker, E.L. 1970. *Systematic instruction*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Wentling, T.L. 1979. The assessment of learning: A base for instructional evaluation. In A.A. Cross (Ed.), *Vocational instruction* (pp. 237-248). Arlington, VA: The American Vocational Association, Inc.

PROJECT REPORT

Outdoor Laboratories In Juniper Studies

Bradley W. Pedersen

Project Proposal

Hypotheses

"The environment for learning has changed dramatically in colleges of agriculture with an increase in students with a non-farm background and decreased practical experience. This requires instructors to better understand the processes and conditions of learning."

Another synonym for "non-farm" might be "non-agriculture." Take the example of the introductory horticulture student. It is typical that these individuals, in majority, also do not come from backgrounds directly involved in the horticulture industry. However, the popularity of horticulture programs in secondary education, junior and senior high curricula has created this same disparity in entry level abilities between these students with some horticultural background and those with none as is most apparent between farm and non-farm background students. Also, it seems apparent that those students with farm backgrounds are more familiar with the culture of plants in general, so in that respect, do have a distinct advantage over the non-traditional farm student.

General Rationale

The problem arises: even though horticulture instructional materials may be introduced at an "intro" level, class membership becomes split almost instantly because some comprehend and others do not.

Pedersen is assistant professor of Horticulture at the University of Minnesota Technical College, Waseca, MN 56093.

From Harland Haslen, University of Minnesota Technical College, Waseca, Grant Coordinator, The Fund for Improvement of Post Secondary Education (FIPSE).