Relationships Between Student and Professor Characteristics and Results of Evaluations

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Previous studies of student evaluations as a means of assessing instructors have concentrated on undergraduate courses taught in departments whose primary effort was apparently dedicated to teaching. However, this scenario is not an accurate reflection of many programs in colleges of agriculture where professional responsibilities are divided among teaching (primarily graduate courses), research and extension. For example, the entomology faculty at Louisiana State University has 7 percent of its professional effort allocated to teaching. At the same time, a recent departmental review with the Cooperative State Research Service indicated that the teaching effectiveness is a matter of concern for both faculty and students. This attention to teaching appears to be concomitant with national, state, and institutional concerns about the quality of university teaching. The only objective measure of teaching available in the LSU entomology department has been the course evaluation. As with many land-grant institutions, LSU tends to base tenure and promotion decisions on research and has, in general, neglected interpretations of teaching evaluations. In addition, the teaching evaluations have apparently never been compiled for the entomology department, and correlations and trends have never been considered. This study examined six years of course evaluations in order to determine trends in teaching and examine possible correlations of the evaluations.

The Value of Student Evaluations

The validity of student evaluations has been criticized in entomology (Brewer, 1981). Brewer based his criticisms on references to the "Dr. Fox Effect" in which teacher enthusiasm was shown to be the primary determinant of student evaluations (Jaftulin et al., 1973; Williams and Ware, 1976, 1977). However, there were several problems with the methodologies of, and inferences drawn from, these studies; the experiments were conducted under artificial learning conditions, only short term learning/retention were tested, and there was no consideration of the effects of repeated (more than two) Dr. Fox lectures. Despite these limitations, the conclusions of Ware and Williams (1975) that student evaluations were not valid indicators of the quality of instruction were accepted by Brewer (1981). Brewer's attention to the invalidity of student evaluations occurred without reference to other studies which showed positive correlations of teacher evaluation and learning (Morsh et. al., 1956; McKeachie and Solomon, 1958; McKeachie et al., 1971; Meinkoth, 1971; Gressnor, 1973). Indeed, Bryson (1974) noted that only one study has shown a negative correlation of evaluations and learning (Rodin and Rodin, 1974), and this study was confounded by an artifact of the design (i.e., a self-paced course format apparently led to an underrepresentation of A-level students at the end of the semester when evaluations were administered.)

Bryson (1974) concluded that the bulk of accumulated evidence suggested that in the absence of other valid criteria of teacher performance, the continued use of student evaluations is warranted. More recent studies at a variety of educational levels have also shown significant relationships between student evaluations and teacher effectiveness (Cohen 1981; Fox et al., 1983; Pittman 1985). Although student evaluations continue to be viewed by teachers with considerable suspicion as an assessment tool (Kouchak et al., 1985), teachers perceive the ability to evaluate programs and curricula as one of the most important needs in the educational process (Borg et al., 1986).

Methods

The Department of Entomology at LSU requires a standard course evaluation instrument to be used in all classes. A set of 470 course evaluations from 1979 through 1984, involving 44 classes, representing 20 different courses, being taught by 19 professors, was used to examine the relationship between 11 variables and the ratings of the course and instructor. This study used the mean of the total evaluation (i.e. the average of all responses on each evaluation) and the means of five sub-scales as the dependent variables. The sub-scales were professor's organization, knowledge, interaction, testing practices, and interest in teaching. The questions on the instruments differed somewhat in 1979 and 1980, so scores for the five specific sub-scales were taken only from the 210 evaluations from 1981 to 1984. In these more recent evaluations, students rated specific statements which were relevant to the sub-scales using a 1 (complete dissatisfaction) to 5 (high level of excellence) system.

The independent variables were:

1. Course level (2000, 3000, 4000, or 7000)
2. Expected grade (A, A/B, B, B/C, C, C/D, and D)
3. Professor's age

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Table 1. Correlation coefficients of the overall course evaluation and sub-scales with selected demographic variables.

Variable	Overall Evaluation[a]	Evaluation of the professor's:[b] Organization	Knowledge	Interaction	Testing	Interest
Course Level	- .18**	- .06	.02	.05	- .04	- .07
Expected grade						
All classes	.13**	.18*	.22**	.25**	.20**	.24**
4000	.17*	.18	.23**	.25**	.18	.22**
7000	.28*	.25	.16	.05	.30	.30
Teacher's age						
All classes	.15**	- .03	- .02	.05	- .13	- .04
4000	.11	- .21*	- .09	.02	- .19	- .11
7000	- .19	.22	.14	.13	.12	.06
Experience						
All classes	- .14**	- .12	- .13	- .06	- .15*	- .10
4000	- .06	- .29**	- .18*	- .09	- .26**	- .19*
7000	- .39**	.35	.16	.29	.29	.20
Refereed publ.						
All classes	.15**	.19*	.16*	.21*	.18*	.24**
4000	.05	.13	.19*	.14	.15	.26**
7000	.61**	.69**	.28	.63**	.69**	.46*
Service publ.						
All classes	- .12*	.10	- .01	- .10	.13	- .01
4000	- .17*	.18	.00	- .10	.13	- .05
7000	- .04	- .56	- .20	- .53**	- .46*	- .38
Total publ.						
All classes	- .02	.25**	.11	.07	.25**	.18*
4000	- .13	.26**	.14	.01	.23	.14
7000	.56**	.73**	.30	.66**	.76**	.49*
Teaching load						
All Classes	.14**	.26**	.23**	.15*	.22**	.20**
4000	.03	.22*	.25**	.14	.15	.18
7000	- .07	- .04	.02	- .03	.14	- .09
Grant support						
All classes	.10	.01	.11	.09	- .04	.03
4000	.11	- .04	.15	.10	- .08	.02
7000	.16	.54**	.25	.47*	.55**	.31
Dept. years						
All classes	- .10	- .19**	- .19**	- .03	- .21**	- .16*
4000	- .02	- .36**	- .29*	- .08	- .29**	- .25**
7000	- .25	.31	.20	.21	.32	.13
Academic Year						
All classes	.03	.29**	.26**	.23**	.24**	.22**
4000	.04	.33**	.28**	.23**	.20**	.26**
7000	.37**	.06	.11	.11	.27	.00

[a] The overall evaluation for all classes is based on 470 course evaluations

[b] The sub-scale evaluations for all classes are based on 210 course evaluations

* Correlation coefficient significant at the .05 probability level

** Correlation coefficient significant at the .01 probability level

4. Teaching experience
5. Number of refereed publications per year while at LSU
6. Number of unrefereed (service, extension, etc.) publications per year while at LSU
7. Total publications per year while at LSU (5 and 6 combined)
8. Teaching load (percent of time allocated to teaching in job description)
9. Research grant support (dollars of outside funding per year while at LSU)
10. Department years (number of years in the department)
11. Academic year (1981, 1982, 1983, 1984)

Correlation coefficients were calculated for each combination of the independent and dependent variables.

After examining the analysis of the overall course (n=470) and the sub-scale (n=210) evaluations the correlations were recalculated. The evaluations of the 2000 and 3000 level courses were dropped and further calculations used only the evaluations for the 4000 (senior level) and 7000 (graduate) courses. The lower level courses were dropped because only three professors had been involved in teaching them. The decision to closely examine the 4000 and 7000 level courses was based on the suspected dichotomy of correlations at these levels.

Results and Discussion

The correlation coefficients for the independent and dependent variables are shown in Table 1. When one examines the overall course evaluation and the sub-scales several observations can be made.

The expected grade was significantly correlated with overall evaluation and all of the specific dependent variables. It is intuitive to expect that the higher a student's grade, the higher his/her evaluation will be; students who perform better in a class probably attribute a portion of their performance to quality teaching. The grade expected in the course was significantly correlated ($p<.05$) of teaching load to total and all sub-scale evaluations is informative. It appears that the best teachers, or at least those receiving the highest evaluations, have the greatest proportion of their responsibilities allocated to teaching. It is interesting that while teaching experience was generally negatively correlated with evaluations, teaching load was positively correlated with evaluations. Since it may be expected that teaching experience and load would be related, a correlation was performed which showed no significant relationship between these two variables ($r=.16$, $p>.05$). It appears that professors who are good teachers are given a greater teaching load.

The number of refereed publications was positively correlated with the total evaluation and interest ($p<.01$) and the remaining sub-scale evaluations ($p<.05$). These data would indicate that better researchers are also better teachers. Such a relationship is consistent with the idea that modern students demand a more thorough and up-to-date understanding of a subject. Evaluations by students in 7000 level courses were more strongly correlated with professors' refereed publication records than evaluations by students in 4000 level courses. These data indicate that professors who publish are considered to be better teachers by the students, especially in higher level courses although the evaluation of a professor's knowledge was correlated ($p<.05$) with publication rate in 4000 level courses but not in 7000 level courses ($p>.05$).

As opposed to refereed publications, service publications were negatively correlated ($p<.05$) with the total evaluation. All evaluations by students in 7000 level courses were negatively correlated with the rate of service publications and these correlations were stronger than those in 4000 level courses. The only positive correlations of service publications to evaluations were with regard to organization and testing in 4000 level courses. The general, negative relationship between service and evaluations may be a function of several factors. Since professors in the department are not assigned service as a portion of their responsibilities, those who devote time to service publications may do so at the cost of teaching and research. A high rate of service publications may imply more time spent in the field and less time for student contact. Finally, a service, rather than an academic orientation may adversely affect students' perceptions in upper division courses.

In combining all publications (both refereed and service) to achieve a measure of writing productivity, it was found that greater productivity was positively correlated ($p<.05$) with evaluations of organization, testing, and interest. Generally, the more productive a professor was in writing responsibilities, the better the teaching evaluation. Although it may be expected that if one maximizes productivity in writing, the time and effort available for teaching will decrease, this relationship is apparently not the case.

The amount of support a professor brings in from outside funding is not significantly correlated with the total or any sub-scale evaluation when all the classes were examined. However, when only 4000 and 7000 level classes were studied, several trends emerged. The evaluation by students in 7000 level courses were more positively correlated with support than in 4000 level courses. Evaluations of organization, interaction, and testing were positively correlated ($p<.05$) with support in student evaluations of 7000 level courses. Since support may be related to research productivity, a correlation of refereed publication rate with support was performed; no significant relationship was found ($r=-.14$, $p>.05$). Thus, the positive correlation of support to evaluations at the 7000 level was not simply a function of the positive relationship of research to evaluations. Perhaps the organizational and persuasive skills associated with acquisition of funding are applicable to teaching and positively reflect on evaluations of specific teaching skills.

Years in the department was negatively correlated with total and all specific evaluations; the correlations were significant ($p < .05$) for all but the total evaluation and evaluation of interaction. As may be expected, teaching experience and department-years were significantly correlated ($r = .72$, $p < .05$). It is apparent that the longer an individual remains in the department, and perhaps in academics in general, the poorer of a teacher he/she becomes, as indicated by students' evaluations. This trend was especially pronounced in 4000 level courses.

In 4000 level courses the overall evaluation and sub-scale scores were negatively correlated ($p < .05$) with teaching experience. In 7000 level courses, only the total evaluation was negatively correlated ($p < .01$) with teaching experience; the evaluation of organization was positively correlated ($p < .05$) with teaching experience. Professors who have accumulated many course-years of experience may suffer from decreasing interest and enthusiasm for their topics. The idealism of the young professor with regard to teaching and student interaction may become tempered with time and tenure; lack of rewards and recognition for quality may decrease the effectiveness of experienced teachers at the university level and account for the negative correlations found in this study.

A final noticeable difference in evaluations was a function of the academic year. The correlation between overall course evaluation and academic year was .37 ($p < .01$) for the 7000 level students but only .04 ($p > .05$) for the 4000 level students. Perhaps the graduate students can see improvement in the program from year to year or they are becoming more comfortable with their own activities, knowledge and role in the field of entomology.

Summary

There are five consistently significant factors which appear to determine the outcome of evaluations in the Department of Entomology at Louisiana State University.

First, the expected grade is positively correlated with evaluation. This relationship may be taken to invalidate course evaluations. However, if grades accurately reflect the amount learned, and the amount learned is an accurate reflection of teaching quality, then, it follows that grades are an accurate measure of teaching quality. While it is not advocated that grades be used as the general criterion for teacher evaluations, for any given student the grade may be a good measure of the teacher's effectiveness.

While evaluations appear to be improving with time, the time spent in the department by a professor is negatively correlated with evaluations. These are not contradictory phenomena; over half of the faculty evaluated in this study have been in the department for less than ten years. Perhaps more importantly, there have been several older professors who have retired from teaching in the last ten years. Thus, over the last several years, the teaching experience in the faculty has decreased. Academic year was found to be negatively correlated with teaching experience ($r = -.42$, $p < .01$). Perhaps contributing to the increase in evaluations with time is the significant correlation ($r = .18$, $p < .01$) of expected grade with academic year. Thus, both grade inflation and decreasing experience appear to be major factors associated with increased evaluations with time.

Fourth, the highest evaluated teachers are those professors with the largest teaching loads. The time spent in this department was negatively correlated ($r = -.45$, $p < .05$) with the proportion of a professor's time allocated to teaching. While the relationship was not significant, it appears that less experienced professors are generally assigned greater amounts of teaching. This is one approach to overcoming the problem of decreasing evaluations with experience or time. However, the decline in a department's teaching with time is only delayed by a shift of teaching responsibilities to younger faculty.

Lastly, the more productive professors are also better teachers, especially with regard to research productivity. The productive scientist is well-informed in his/her subject area and may be expected to possess good organizational skills. However, it is important not to interpret a correlation as cause and effect; doing good research can not be expected to make one a good teacher. Finally, though research productivity is associated with high evaluations (especially in upper division courses), the exclusive encouragement and reward of research may well contribute to the eventual decline in teaching quality with academic experience.

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FACTORS Students Consider in Selecting A University or College

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Background

In 1984, the University of Idaho established a Long-Range Plan with 15 goals with corresponding strategies to promote positive institutional development. Goal I, "To Attract and Retain Well-Qualified Students," contains in its discussion section the following:

> "...the University is adopting the... strategy of maintaining its current share of the projected increases in the (overall state) system, with modest increases of approximately two to two and one-half percent per year anticipated over the next decade."
>
> "The University does... see a need to focus its efforts on attracting and retaining high-quality students... The University currently attracts a significant percentage of the state's outstanding high school graduates. Still, it has been estimated that 45 to 50 percent of those academically superior students go out of state for their undergraduate education. This brain drain will probably increase in the next decade because enrollment declines of 20 to 25 percent are predicted for many states in the nation. This will cause first the private and then the public colleges and universities in other parts of the country to recruit more aggressively in states like Idaho. The University must actively counter such actions."

The Long-Range Plan suggests some counter strategies:

> "Develop a professional, comprehensive, well-coordinated recruitment case that emphasizes the University's strengths and promotes the enrollment of well-qualified students."
>
> "Improve communications with secondary school teachers, counselors and administrators."

Reisch (1985) made the following similar observations about college of agriculture recruiting and retention:

> "We are concerned about the declining enrollment in our agricultural programs nationwide. Enrollment in our land-grant colleges of agriculture has declined nearly 25 percent in the past five years. This, coupled with a shortage of agricultural scientists and an unusually high percentage of faculty who are of retirement age, has created a national concern for the expertise needed to respond to the challenges of the next 16 years and on into the 21st Century. ...The Joint Council on Food and Agricultural Sciences has ranked the development of Scientific Expertize second only to Basic Biotechnology Research in eight national priorities for 1985."
>
> "For years we've extolled the career opportunities in agriculture without really knowing the needs or desires of our customers, the prospective students. We are no longer in a sellers' market and must work hard to enhance the perceptions of agricultural careers and to convince a population with fewer and fewer rural people that there are career areas that will meet their needs. ...Marketing is the name of the game today, and we must get on with it. It is our task to continue the lifeblood of our programs, the vocational agriculture and agricultural background students, and also to attract those urban/suburban who are now enrolling in engineering, computer science, pre-medicine, pre-law, etc."

Ross (1980), additionally, states that decreases in enrollment in colleges of agriculture suggests the potential for increased competition among institutions of higher education in attracting students. One component of the knowledge needed to compete effectively concerns information from current students on reasons for their institutional selection, positive and negative aspects of the college, and selected socio-economic data from the students.

The University of Idaho and, assumedly, many other land-grant universities, are becoming increasingly aware of the shrinking pool of potential students. Colleges of agriculture, especially, are planning marketing strategies to attract the potential student who has been the mainstay of their enrollment. But, more importantly, colleges of agriculture are planning marketing strategies to attract those students who are outside the traditional target market.

Basic to any marketing strategy is the activity of informing the potential student, regardless of the pool, as to the strengths and/or "marketable" features of a particular university or college. If the "marketable" features of the university or college and the factors

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