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ABSTRACT

This study determines empirically the relationship between college teachers' classroom performance and their involvement in research. The study is based on a national sample of approximately 5,000 faculty members in 16 colleges. Ratings of classroom performance were derived from published course critiques and scholarship ratings are based on a weighted publication score or citation score. Findings show that there is little or no correlation between teaching ratings and scholarly activities and, because of this, that universities should recruit faculty who are strong in both areas. Further investigation found that (1) professors teaching upper division and smaller enrollment courses receive better evaluations than colleagues in lower division and larger courses; (2) teachers in the languages received highest teacher ratings, followed by humanities, other social sciences, professional schools, physical and biological sciences, sociology, and psychology; and (3) the relationship between class enrollment and teacher ratings is curvilinear with very small and very large classes receiving highest ratings. (Author/HS)

Final Report

Project No. 0-A-045
Grant No. OEG-1-70-000045-0014 (509)

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DIMENSIONS OF ACADEMIC COMPETENCE:
The Relationship of Classroom and Research Performance of College Faculty

June, 1972

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

Regional Research Program
Boston, Mass.

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U.S. DEPARTMENT OF
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ABSTRACT

DIMENSIONS OF ACADEMIC COMPETENCE:
The Relation of Classroom and Research Performance of College Faculty

Arnold S. Linsky and Murray A. Straus
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This study determines empirically the relationship of college faculty's classroom performance and their involvement in research. The study is based upon a national sample of approximately 5,000 faculty in 16 colleges. Ratings of classroom performance are derived from published "course critiques." Scholarship ratings are based on a wieghted "publication score" or "citation score." There appears to be little or no correlation between teaching ratings and scholarly activities.

One implication of the absence of relationship between teaching and research abilities is that universities that are sufficiently competitive should recruit faculty who are strong in both teaching and research since being good in one role is certainly no bar to being good in the other.

In additional investigations we found 1) professors teaching upper division and smaller enrollment courses received more favorable evaluations that colleagues in lower division and larger courses. 2) teachers in the Languages received highest teacher ratings, followed by Humanities, "Other Social Sciences," Professional Schools, Physical and Biological Sciences, Sociology and Psychology last. 3) the relationship between class enrollment and teacher ratings is curvilinear with very small (under 30) and very large (over 300) classes receiving highest ratings.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This study analyzes and describes a great deal of data about two major roles of college professors: (1) their performance in their classrooms and teaching roles, and (2) their performance as researchers and scholars in their disciplines. A major emphasis of the research is on the interrelationship of these two roles. The study is based on a national sample of approximately 5,000 college and university teachers located at sixteen institutions of higher education.

The original and major focus of the study was to determine empirically the direction and form of the relationship between quality of classroom performance and involvement in research and, if the data allowed it, to attempt to explain the relationship which emerged. Once the basic data set was compiled for the sample, which consists of considerable detailed information about the individual faculty teaching performance, quantity and quality of their research output, and personal characteristics data, it was possible to investigate a series of additional questions of considerable import for administration and planning in higher education. These questions include:

1) Are there systematic differences between the teaching performances for the different academic fields and are such differences stable from one institution to the next? Are there characteristic differences between groups of disciplines (e.g., Social Sciences vs. Humanities) and are there stable differences within each of these broad groups (e.g., within Social Sciences, are political scientists rated more highly than historians as teachers, etc.?)?

2) What are the determinants of successful classroom performance (as measured through student evaluations of teaching) of college teachers. Is it

completely a matter of the personal characteristics, experience and training of the individual instructor such as rank, degree, years since completion of the Ph.D., and the ranking of the institution from which he received his highest degree? Or is the rating of a college professor primarily affected by his position within the University structure (his field, level and type of course, size of class, etc.)

3) What is the precise relationship between enrollment, size of class and the evaluations of the instructor and the course? Are there critical points in increasing size of classes at which the quality of the experience changes sharply or is it a continuous change with size? Is the relationship of size and classroom performance linear or nonlinear? Separate substudies that will be reported in the following sections deal with each of these issues.

PROCEDURES

Essential data for the study were already available although they had been gathered originally for other purposes. Ratings of classroom performance of teachers is derived from the series of "course critiques" published by a large number of universities and colleges during the last five or six years. These course critiques could be criticized on the grounds that they represent only one perspective on classroom performance, i.e., the student's. However, the few empirical studies of student ratings suggest that they have a high degree of reliability, are relatively independent of the grades received by the student (Voeks, 1962) but <u>are</u> related to the number of students who take additional courses in a department, i.e., a larger proportion of students in

sections taught by professors with high ratings took additional courses in the field (McKeachie, 1958; McKeachie and Kimble, 1968). One need not be committed to the complete validity of the student course evaluation to recognize their importance as an index of student reactions to teaching. Without downgrading other types of evaluation, composit judgements of large numbers of students must be taken into consideration in evaluating teaching performance.

The present study is based on data from sixteen schools.[1] Essentially, this is an "availability" sample of universities selected on the basis of whether a course critique useful for our research was published. (If, for example, ratings were not quantified, we were not able to use them.) However, the sample includes within it various types of colleges and universities including large and small, public and private, prestigious and less distinguished institutions. Hence, findings of the study should provide a better basis for generalization that any study done at a single school. The sample on the whole is over-representative of larger and better known universities. The "bias" of the sample may actually aid the validity of the study in this case. If teaching and research are uncorrelated for this population of relatively "high powered" institutions, then it is very unlikely that they would be correlated in other institutions in which research is not a major goal.

The set of Teaching Evaluation questions on which students were asked to rate professors and courses varied with each of the schools compared. Usually, we had information on approximately ten items on each professor. To get an over-all rating of professors' classroom teaching performance, we combined the average ratings on several of these items for each school. Although the

questions were not strictly identical, there was enough overlap in the content to allow comparison between schools of an overall teacher's rating.[2] Where faculty were listed for more than one course, ratings were averaged. Some of the individual items that went into the overall rating are also treated separately in the analysis where possible, since they relate to substantially different aspects of teaching performance such as instructors' "personalization" and "course content."

Since the analysis to be reported involves the ratings of faculty in 16 different colleges, it was also necessary to convert all teaching scores to a common unit of measurement. For this purpose, we carried out a z-score standardization by subtracting the raw score for each faculty member in a college from the mean score for that college or university and dividing the resulting figure by the standard deviation of ratings for the entire college. The resulting z-scores express the teaching rating of a faculty in terms of the number of standard deviations which he is above or below the mean for all faculty in his college.

Data on the "nonteaching role" of each professor are limited to two measures of research and scholarship.

A Publication Score was computed based on a weighted summary score for articles and books written over an approximately 20 year period [3] (Straus and Radel, 1969). This score was limited to eight disciplines because of the enormous amount of time required to complete the bibliographical search for each discipline: one applied field, Engineering; one physical science, Physics; one biological science, Biology; two humanities, English and Philosophy; and three social sciences, Anthropology, Sociology and Psychology.

A Citation Score was based on the number of times a scholar's work was cited by others over a ten year period. It is felt to reflect the scholarly impact rather than output, or the amount of influence or salience which a scholar's work has. Thus, it is a more qualitative measure of scholarship than is the Publication Score. The data were obtained from the Science Citation Index. This measure was limited to the fields for which publication data were compiled and which were covered by the Index. Hence, English and Philosophy are omitted from the Citation Scores.

A number of other variables included in the study as additional independent variables and as control variables are course level, instructor's rank, degree, years since completion of the Ph.D., course enrollment, course level, and prestige ranking of institution from which instructor received his highest degree (Cartter Ratings). Data on these variables were obtained either from the course critiques themselves or from a catalog of the institution.

Much of the original research period was consumed with assembling a massive amount of research data on approximately 5,000 faculty on 16 campuses, tabulating and coding it, and preparing it to be placed on tapes for computer analysis. This proved to be a monumental task with over one man-year spent on tabulating, coding and transcribing data along.

RESULTS

Results of this study are in the process of being communicated to the higher education community in a series of six papers, each covering part of the investigation to date. This section is divided into subsections. Two

papers have already been written from the project. The first paper entitled "Student Evaluations of Teaching: A Comparison of Sociology with Other Disciplines," is in press (to appear in Teaching Sociology, Vol. 1, No. 1, 1972). (Originally read at the American Sociological Association Annual Meetings, Sept. 1, 1970,)

A second paper entitled "Student Evaluations and the Research Productivity and Eminence of College Faculty" has been completed and is in preparation for submission for publication to the Bulletin of the American Association of University Professors. A late draft of this paper (which was also read before the American Sociological Association Annual Meeting, Denver, August 29, 1971) is attached as Appendix A-2.

This section summarizes the findings from those completed studies and indicates additional studies that are close to completion.

Paper #1. "Student Evaluations of Teaching: A Comparison of Sociology with Other Disciplines," (the abstract follows and the full paper is appended) compares the students' evaluation of the classroom performance of faculty in different broad fields of study. It describes the rank order of fields according to student ratings and attempts to explain the order by consideration of additional variables. Within the paper we considered sociology and psychology separately because of the substantive focus of that particular paper while grouping the remaining disciplines into five major categories: languages, humanities, other social sciences, professional schools and physical and biological sciences.

To appear in Teaching Sociology
Vol 1, No. 1, 1972

STUDENT EVALUATIONS OF TEACHING:

A COMPARISON OF SOCIOLOGY WITH OTHER DISCIPLINES*

Arnold S. Linsky and Murray A. Straus
University of New Hampshire

Abstract

This study investigated how sociologists were rated as teachers in comparison with their colleagues in six other fields. Students' evaluations of professors' classroom performance were obtained for 16 colleges and universities. Ratings of classroom performance were derived from published course critiques. In a comparison with seven fields, sociology shares the lowest ranking with psychology. The rank of the other fields is (from highest to lowest): Languages, Humanities, Other Social Sciences, Professional Schools, and Physical and Biological Sciences. Several alternative explanations are examined to account for this pattern: (1) larger class enrollments in sociology, (2) indefiniteness of the content of sociology, (3) unmet student expectations with regard to the goals of sociology, (4) lack of career relevance of sociology, and (5) selective recruitment of highly alienated students. Some support was found for each explanation, but none appears fully adequate based on the limited data available. The concluding discussion suggests that teacher ratings based upon course critiques confound within a single measure: (1) the students' evaluation of the teacher's role performance and (2) the degree of role consensus between faculty and students concerning the teacher-student relationship.

* *

Paper #2, in preparation, describes the comparison of classroom ratings for each separate discipline within the broad categories of the previous paper. English and Philosophy, Art and Classics are each compared within the broad categories of Humanities. Table 2 which follows provides separate teacher ratings for thirty academic disciplines. The paper which is planned for publication in one of the journals which has a wide cross-disciplinary readership also examines some possible explanations for the ordering of fields discovered by means of group level correlations. Table 1 which follows contains preliminary data on evaluation of teachers by field from highest to lowest for 31 fields.

TABLE 1 about here

PRELIMINARY DATA

TABLE 1. TEACHING RATING - BY DISCIPLINE

Rank Order (Z Scores)

Discipline	N	Teacher Rating "Z"	SD
Botany	24	+5.17	8.77
Other Languages	51	+5.08	12.34
Art	150	+4.65	9.63
Genetics	6	+4.33	8.94
Astronomy	4	+3.25	5.85
History	369	+3.04	8.72
Classics	34	+3.03	13.39
European Languages	555	+2.93	9.20
Natural Sciences	7	+2.43	11.47
Philosophy	146	+1.97	9.62
Physiology	4	+1.75	9.29
English	604	+1.68	8.99
Zoology	54	+1.28	14.39
Anthropology	84	+0.15	8.93
Biology & Microbiology	67	-0.21	8.18
Engineering	156	-0.24	9.23
Political Science	223	-0.32	8.93
Business	174	-0.33	9.37
Education	175	-0.44	10.27
Language & Linguistics	23	-1.09	9.73
Geography	82	-1.52	7.53
Chemistry	192	-1.82	9.09
Economics	165	-2.04	8.88
Sociology	183	-2.63	9.14
Mathematics	290	-2.73	9.25
Geology	59	-2.81	9.54
Physics	170	-2.81	9.35
Biochemistry	35	-2.86	8.94
Psychology	197	-3.45	8.96
Physical Science	24	-4.13	7.27
Meteorology	5	-6.20	12.40

Paper #3, "Student Evaluations and Research Productivity and Eminence of College Faculty," focuses on the major issues of the relationship of research performance to classroom evaluation. An abstract follows and the detailed data is contained in the appended paper.

STUDENT EVALUATIONS AND RESEARCH PRODUCTIVITY AND EMINENCE OF COLLEGE FACULTY

Arnold S. Linsky and Murray A. Straus
University of New Hampshire

ABSTRACT

The relationship of a professor's classroom performance to his involvement in research has been vigorously disputed for some time, but discussions of this problem have been largely polemical. This study determines empirically the relationship of these two different dimensions of academic competence.

There are at least three basic possibilities regarding the relationship of teaching and research abilities: a) Teaching and research are positively correlated, i.e. good researchers make good teachers while poor researchers make poor teachers; b) Teaching and research abilities are oppositely related -- good researchers make poor teachers and good teachers make poor researchers; c) Teaching and research abilities are independent. There would seem to be an ample rationale for both the positive and negative correlations between teaching and research.

Essential data for the study were already available although they had been gathered originally for other purposes. Ratings of classroom performance of teachers is derived from "course critiques" published by a large number of universities and colleges.

The present study is based on a national sample of sixteen colleges and universities selected on the basis of whether a course critique useful for our research was published. It includes within it a variety of types of colleges and universities including large and small, public and private, prestigious and less distinguished institutions. Two

measures of the research and scholarship role are used:

a) A Publication Score was computed based on a weighted summary score for articles and books written over an approximately 20 year period.

b) A Citation Score was based on the number of times a scholar's work was cited by others over a ten year period. It is felt to reflect the scholarly impact rather than output and is based on data obtained from the Science Citation Index.

Overall Teacher Rating correlates only .04 with Total Publications Score indicating an almost total absence of relationship between these two major variables. Likewise the overall teaching score fails to show any correlation with separate components of total Publication Score such as books authored, articles written, etc. Citation score is correlated -.05 with overall teacher rating.

Publication and citation do seem to be correlated with students' evaluation of the Instructor's Knowledge (as rated by students). The rating for Instructor's Knowledge is correlated .27 with Total Publications. Research performance is also consistently correlated with students' evaluation of the Course Content, although correlations are small.

Since research activity does not seem to be closely related to classroom performance several other factors which might influence classroom performance, as measured through student evaluation were considered in the second part of the paper. These are:

1. Situational factors: There is a very small positive correlation (.08, N=4646) between teaching rating and course level with more advanced courses receiving more favorably ratings. Enrollment or class size is somewhat negatively correlated with teaching rating. Ratings also vary systematically by field. From this data it would appear that teacher ratings are only partly due to individual differences in teaching

abilities but also vary with position within the social structure of the University.

2. Personal Characteristics. Academic Rank is uncorrelated with overall teaching score (r=.00) N=3530). However, rank is(a low positive) correlated with some of the separate components of the teaching score, with students' evaluation of course content (r=.09, N905) and with instructor's knowledge (r=.25, N=1093). Highest degree held appears to be almost unrelated to teaching rating (r=-.06, N=2758). Classroom performance also appears to decline over the course of a teacher's career as indicated by the correlation between teacher rating and years of Ph.D. (r=-.08, N=1729). It must be kept in mind that this is not longitudinal data, but reflects persons at different stages of their career at a point in time.

This study found teaching, as measured through overall student evaluations, essentially uncorrelated with indices of research performance. Teaching ratings were found to vary systematically with certain personal and situational variables that were subsequently considered. The finding of lack of relationship between teaching and research has important implications for university recruitment and personnel planning.

Paper #4, the next substudy, "Seniority Versus Merit in the Reward System of Academia", (abstract follows) replicates part of the major study just described with data from a completely different population. Professor Straus was able to obtain the data from a random sample of the faculties of 50 colleges of agriculture. In this study the measure of teaching effectiveness is the faculty member's self-perceived teaching ability in contrast to the student evaluations used in our own sample. The overall findings of only a slight positive correlation between research and teaching performance is consistent with the findings from our sample of 16 colleges and universities which further strengthens the conclusion that there is little or no correlation between classroom evaluation of teaching and research productivity. This finding appears to hold regardless of which measure of teaching effectiveness is utilized.

January 1972

Abstract

SENIORITY VERSUS MERIT IN THE REWARD SYSTEM OF ACADEMIA

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Data on the research productivity and self-perceived teaching ability of a random sample of faculty in colleges of agriculture (N = 477) show little tendency for these two aspects of the academic role to be associated (r = .08). In addition, neither research performance nor teaching performance are correlated with rank, though what little correlation there is suggests that teaching is more highly rewarded than research (r = .07 versus -.07). Instead, the largest single correlate of academic rank is age (r = .58) and length of service at the college (r = .54). Neither age nor length of service are indicators of high performance as a teacher or researcher (the correlation of age with research productivity is -.17 and of age with teaching excellence .03; the correlation of length of service is .05 with research productivity and -.11 with teaching). Similar conclusions are reached if salary is used as the criterion of reward in the academic system. However, those high in teaching performance tend to differ from those high in research performance in certain ways. Teaching performance is associated with career satisfaction but research performance is not (r = .20 versus -.01). Those high in teaching tend to focus their activities strictly within their college whereas those high in research tend to belong and attend state and national scientific organizations. Finally, although high ability in teaching and research

do not, on the average, get reflected in higher rank or pay, there is some tendency toward rational allocation of roles since those high in teaching tend to spend a larger percentage of their time at teaching (r = .20).

The results of this study cast doubt on the several academic myths, including the student myth that teaching and research are <u>inversely</u> related, the faculty myth that teaching and research are <u>positively</u> related, the publish or perish myth, and the belief that American colleges are run on a universalistic-competitive basis with the highest rewards going to those who make the greatest contributions to teaching and research. If there is any relation between teaching and research performance and reward in the academic system, it probably applies only to the relatively few who are either so outstandingly bad that they are eliminated from the system, or that tiny minority who achieve national fame. The latter have high visibility but are not numerous enough to alter the conclusion that the American academic system bases its rewards primarily on seniority and administrative contribution rather than achievement in teaching or research.

Paper #5, a fifth substudy entitled "Class Size and Teaching Effectiveness at 16 Institutions of Higher Education" by Kenneth D. Wood undertook a detailed analysis of the relationship between class size and student evaluations of teaching performance.

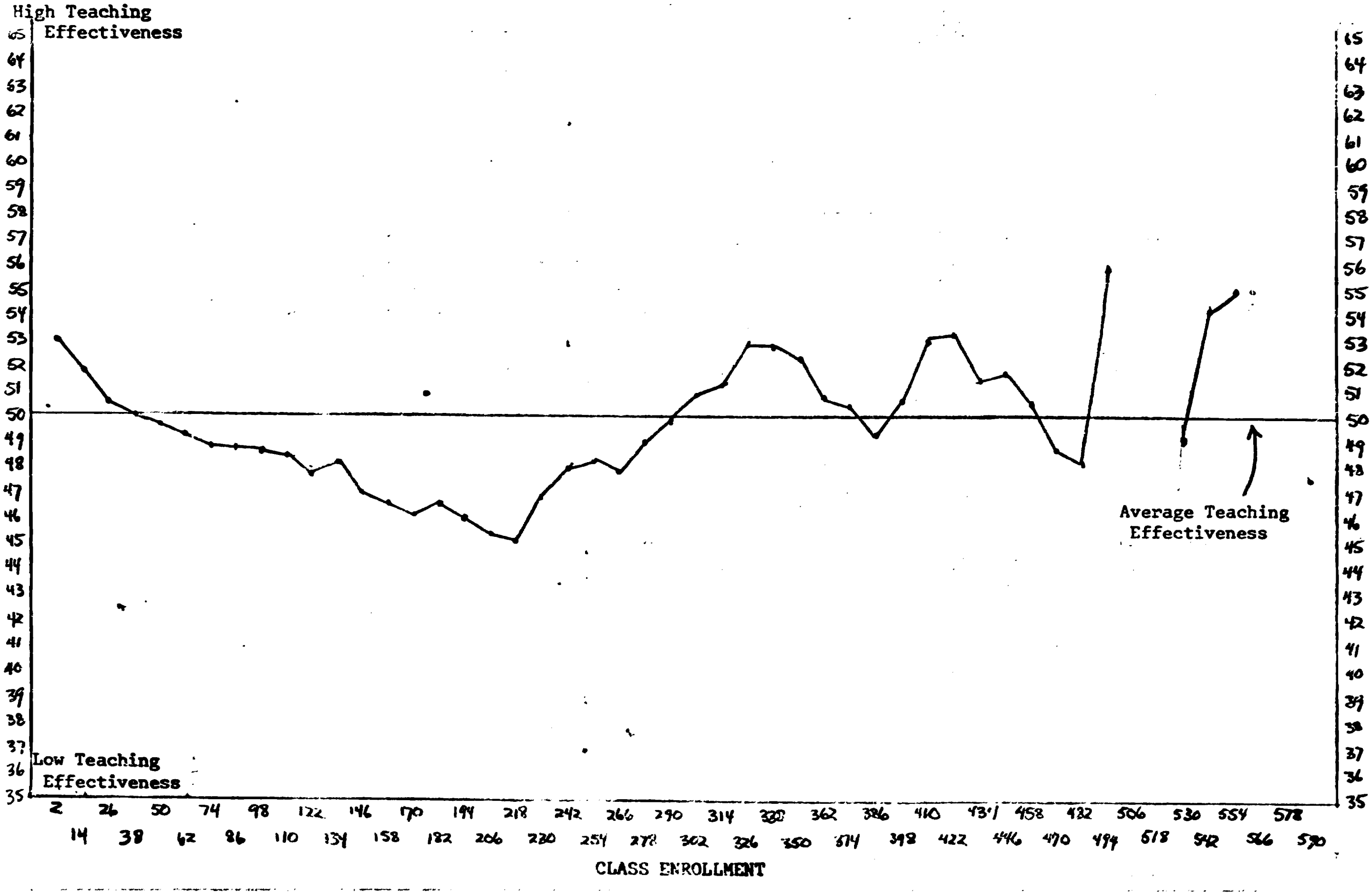
Figure 1 presents the main data. This analysis is still in preparation so that findings reported may be considered only as preliminary. The previous research studies of this issue indicated considerable inconsistency in their results. Many of the studies were based on comparison of large and small classes at a single institution with some arbitrary cutting point for large vs. small classes. Cutting points varied between studies. Given the essentially curvilinear relationship found by Wood when all class sizes are considered, it is easy to see why there would tend to be inconsistency in previous studies which used different cutting points or considered only part of the range of class sizes. The left hand section of the graph indicates a negative correlation between class size and teacher rating. Average teaching evaluation is quite high for the very small enrollment courses and falls at a fairly constant rate. At class size 40 evaluation falls below average and continues downward until 220. The curve then changes direction with classes of 300 and over receiving very favorable evaluations.

One interpretation of these findings is that Professors "gear-up" to really large classes by tailoring their teaching methods especially for such classroom situations and so perform better than professors teaching one hundred students who continue to utilize teaching methods that are successful only in smaller classes.

A second interpretation is that "star" classroom performers are especially selected by their departments to fill the large class situation and also teachers with outstanding reputations may be the "cause" of the large class by drawing enrollments.

The study has many important implications for university planning for maximum effective use of faculty resources. Where enrollment responsibilities are high, it would seem to make more sense to run several courses in the very large size range and to utilize the faculty resources saved by providing classes under thirty as opposed to providing many classes at a uniform average size of 100-200. Apparently little would be lost in abandoning classes of this size.

FIGURE 1. CLASS ENROLLMENT AND TEACHING RATING



Paper #6. The analysis for a final paper which is in progress elaborates the relationship between different aspects of teaching performance and research performance for all schools together. This concluding paper will answer the following questions:

1. Does the relationship between teaching ratings and research performance which has so far been calculated only for the entire sample vary between (a) different groups of academic disciplines (social sciences, humanities, physical sciences, applied sciences, etc.)? (b) types of colleges and universities (large-small, high prestige and less distinguished universities, schools with large graduate programs vs. strictly undergraduate institutions, etc.?

2. What is the form of some of the relationships that have been analyzed so far only at the level of overall correlations? For example, an overall inverse correlation between years since Ph.D. and teaching ratings has been found. Based, however, on some hand-sorted data for a single college, we suspect the relationship is actually curvilinear, i.e., that classroom performance increases with the first few years, plateaus, and then declines later. (a) Relationship between classroom teaching ratings and research performance may also be curvilinear. We are testing for this possibility by construction of detailed bivariate tables for teaching and research.

Different combinations of the two dimensions of teaching and research may be expressed in the following fourfold table:

		Teaching Quality: High	Teaching Quality: Low
Research and Scholarship Distinction	High	good teacher good researcher a	poor teacher good researcher b
	Low	good teacher poor researcher c	poor teacher poor researcher d

Descriptive profiles are being prepared of four academic types (a) "the academics" who are faculty who rank high on both teaching and research. (b) the "researchers" who rank high on research but low on teaching. (c) the "teachers" who rank high on teaching and low on research. (d) and finally those who rank low on both teaching and research.

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CONCLUSIONS

Several conclusions are possible on the basis of the research accomplished during this project. Because of the large number of professor and classroom evaluations involved and the large number and variety of types of institutions of higher education, these findings are much more definitive than the few previous studies which have examined some of the same areas.

1) Our findings with regard to the major investigation of the project were that there is only a slight or no correlation between teaching effectiveness as measured by course critiques and scholarship as measured by publications and citations ($r = .04$, $N = 1422$). This was true both for our national sample which employed student evaluations of teaching and for a separate sample of professors in schools of agriculture for which replication was possible ($r = .08$, $N = 477$). For the latter group self-evaluation of teaching effectiveness by the professors was employed, thus strengthening confidence in the findings.

2) Those professors who teach upper division and smaller enrollment courses are more likely to receive favorable evaluations from students than their colleagues in lower division and larger enrollment courses.

3) One of the earliest sub-studies in our investigation compared seven disciplines or groups of disciplines on teacher ratings. Teachers in the Languages received highest teacher ratings, followed by Humanities, "Other Social Sciences," Professional Schools, Physical and Biological Sciences, Sociology and Psychology last. This order was substantially stable for the 16 colleges and universities. From this data it would appear that teacher ratings are only partly due to individual differences in teaching ability but also are a positional attribute.

4) Academic rank is uncorrelated with teaching ratings but is correlated with publication scores ($r = .39$, $N = 1065$) and citation score ($r = .24$, $N = 563$).

This would seem on first glance to provide some support for the "publish or perish" hypothesis of academic success. However, the strongest correlation between rank and any other variable is with the number of Ph.D. years or length of service ($r = .63$, $N = 1735$). Thus, even the group of highly competitive universities and colleges represented in the sample primarily reward people on the basis of seniority or length of service. A more accurate description of the typical academic career than "publish or perish" would be "remain and rise."

5) Classroom performance would appear to decline somewhat over the course of a teacher's career as indicated by the correlation between teacher rating and Ph.D. years of $-.08$ ($N = 1729$). It must be kept in mind that this is not longitudinal data but reflects persons at different stages of their careers at a point in time.

6) The relationship between class size and teaching ratings appears to be curvilinear. Average teaching evaluation is high for very small classes but falls continuously until it reaches a low point at a little over 200 students. The curve then changes direction with classes of 300 and over receiving very favorable evaluations.

RECOMMENDATIONS

Although the findings are clear, the implications are conflicting given the dual commitment of at least most colleges and universities to both teaching and research activities.

One implication is that there would seem to be some value in developing more independent reward systems for teaching and for research than currently exist, since at best they are only weakly correlated. There is apparently no reason why the same goals could not be obtained by allowing a greater "division of labor" with faculty specializing in either research or teaching

without career penalties.

A second and seemingly contradictory implication is that universities should hire primarily according to promise as a researcher. Such institutions will get a greater overall return for their money since such research productive faculty are on the average at least as good teachers as those not partaking in research.

If the goal of an institution is only teaching, and research is seen as either unimportant or as instrumental to producing good teaching, then there is little point to take research productivity into account in hiring or promoting, since these data suggest that research is not necessary for good teaching, at least as rated by students.

A further implication is that universities that are sufficiently competitive should recruit faculty who are outstanding in both teaching and research dimensions of the academic role since being good in one is certainly no bar to being good in the other respect. Since this combination of being high in both teaching and research is as common as any other combination of these traits, it should be well within the limits of possibilities.

The relationship between class size and evaluation appears to be curvilinear with the very small (under 30) and the very large (over 300) classes receiving the most favorable ratings. This suggests important implications for university planning maximum effectiveness in use of faculty resources. Where enrollment responsibilities are high, it would seem to make more sense to run several courses in the very large size range and to utilize the faculty resources saved by providing classes under thirty as opposed to providing many classes at the uniform average size of 100-200. Apparently little would be lost in abandoning classes of this size.

Since the results of this research show that good teaching is partly a function of structural factors within the University, efforts to improve college teaching should not be limited to improving the skills of individual teachers but should also focus on bringing about the conditions under which good teaching is possible.

FOOTNOTES

1. The schools are Boston College, Columbia College, Barnard, McGill University, University of Southern California, Yale, University of Minnesota (Duluth), SUNY (Buffalo), University of New Mexico, University of California at Los Angeles, University of Texas (Austin), Ohio State University, University of Washington, University of Utah, University of New Hampshire.

2. A copy of the specific questions used for each school may be obtained from the National Auxiliary Publication Service by requesting document number and remitting $1 for a microfiche copy or $3 for photocopies to: ASIS-National Auxiliary Publications Service, c/o CCM Information Sciences, Inc., 22 West 34th Street, New York 10001.

3. An individual's publication score was completed as follows: 1 point for each article (whether sole or joint author); 2 points for an edited book; 4 points for a jointly authored book; and 6 points for a solely authored book.

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STUDENT EVALUATIONS OF TEACHING:

A COMPARISON OF SOCIOLOGY WITH OTHER DISCIPLINES*

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Abstract

This study investigated how sociologists were rated as teachers in comparison with their colleagues in six other fields. Students' evaluations of professors' classroom performance were obtained for 16 colleges and universities. Ratings of classroom performance were derived from published course critiques. In a comparison with seven fields, sociology shares the lowest ranking with psychology. The rank of the other fields is (from highest to lowest): Languages, Humanities, Other Social Sciences, Professional Schools, and Physical and Biological Sciences. Several alternative explanations are examined to account for this pattern: (1) larger class enrollments in sociology, (2) indefiniteness of the content of sociology, (3) unmet student expectations with regard to the goals of sociology, (4) lack of career relevance of sociology, and (5) selective recruitment of highly alienated students. Some support was found for each explanation, but none appears fully adequate based on the limited data available. The concluding discussion suggests that teacher ratings based upon course critiques confound within a single measure: (1) the students' evaluation of the teacher's role performance and (2) the degree of role consensus between faculty and students concerning the teacher-student relationship.

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How are sociologists rated as teachers compared to those in other disciplines? How are their courses rated by their students in comparison with courses in art, history, psychology, or chemistry? To what extent are the ratings of teachers related to the interest inherent in the subject? These are a few of the questions we attempted to answer in this study of student evaluations of sociology professors and others.

The issue of the quality of classroom teaching of sociology has become increasingly salient in the last few years. How good a job we are doing in teaching sociology seems to be beset by paradoxically opposite developments. On the one hand, we have criticism from many students about the seeming irrelevance of what we are teaching, our preoccupation with theory and methods, and the development of the discipline, and our lack of personal and professional involvement in processes of social change. Such criticism has not been limited, of course, to our students. We have been similarly chastened by our fellow sociologists about the poor and unimaginative quality of teaching of sociology and offered suggestions for improving it (e.g. Apostle, 1968; Friedland, 1969).

On the other hand, enrollments in undergraduate sociology courses and the number of majors have burgeoned in the last few years. This would seem to indicate that students find the field of sociology attractive, if not its style of promulgation in the classroom.

SOURCE OF DATA

Data for this report is taken from a larger study of academic competence, investigating the relationship of a professor's classroom performance to his involvement in research. The larger study involves a national sample comprised of the faculties of sixteen universities covering almost all disciplines. This is a convenience sample, selected on the basis of whether a course critique

useful for our research was published, i.e., critiques which included systematic, quantitative ratings on professors and courses.[1] The sample includes a wide range of institutions, including large and small, public and private, prestigious and undistinguished institutions, but is overrepresentative of larger and better known universities.

From each of these course critique books, we extracted student evaluations of professor's classroom performance individually and by discipline. Later, we expect to correlate teaching performance ratings with other measures of academic competence, such as research productivity and professional eminence. The present study is limited to comparisons by discipline based on the teaching evaluations.

Course critiques or course evaluations have been published by a large number of universities and colleges during the last five to six years. Most state as their goals, providing objective information to aid students in the selection of courses and improvement of teaching through drawing attention to student views. Whether or not they have met these goals is unclear, but they have, at the minimum, provided interesting reading in many college communities.

"Course critiques" have been criticized on the grounds that they represent only one perspective on classroom performance, i.e., the student's. However, the few empirical studies of student ratings suggest that they have a high degree of reliability, are relatively independent of the grade received by the student (Voeks, 1962) but are related to the number of students who take additional courses in a department, i.e., a larger proportion of students in sections taught by professors with high ratings took additional courses in the field (McKeachie, 1958; McKeachie and Kimble, 1968). One need not be committed to the complete validity of the student course evaluation to recognize their importance as an index of student reactions to teaching. Without downgrading

TABLE 1. STUDENT'S EVALUATION OF INSTRUCTOR'S CLASSROOM PERFORMANCE BY FIELD FOR SIXTEEN SCHOOLS[a] (AVERAGE Z SCORES)

FIELD	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	All Schools[c]	All Schools[d]
Languages	(+.08)	(+.25)	(+.33)	+.29	+.29	(+.38)	+.54	(+.10)	+.08	+.34	(+.29)	+.08	+.13	+.36	+.33	+.29	+.25	+.26
Humanities	+.26	+.18	-.55	+.28	+.04	+.01	+.26	+.26	+.16	+.15	-.37	-.06	-.15	-.09	+.39	+.15	+.13	+.06
Social[b] Sciences	+.23	-.16	.00	+.05	-.04	+.18	-.02	-.01	-.26	-.29	+.38	-.04	+.29	+.40	+.40	+.28	+.07	+.09
Professional Schools	-----	(+.82)	-----	-.33	+.02	-.11	(+.08)	(+.08)	+.39	----	-----	+.10	+.09	-.12	-.18	-.06	-.08	+.06
Physical and Biological Sciences	-.35	-.30	+.14	-.15	-.12	-.02	-.39	+.09	-.03	-.34	(-.37)	-.05	-.17	-.14	-.34	-.28	-.19	-.17
Sociology	(-.68)	(+.25)	(-.27)	-.45	-.29	(-.33)	-.71	(-.94)	(-.92)	-.23	(-.37)	(-.36)	(+.20)	-.36	-.17	-.08	-.33	-.36
Psychology	(-.14)	(-.65)	(+.45)	-.47	-.12	--.21	-.79	(-.07)	(-.90)	-.31	(-.25)	--.12	-.37	(.17)	+.01	-.96	-.36	-.31

[a] See text footnote no. 1 for description of the schools
[b] Other than psychology and sociology
[c] Average Weighted Z scores
[d] Average Unweighted Z scores

( ) Indicates that the score is based on less than 10 courses

other types of evaluation, the composite judgments of large numbers of students must be taken into consideration in evaluating teaching performance.

While the critiques were originally intended to provide information on individual professors and courses, they also provide information on the comparative standing with students of the teaching within the different academic disciplines.

The set of questions on which students were asked to rate professors and courses varied with each of the schools compared. Usually we had information on approximately ten items on each professor. To get an overall rating of professor's classroom teaching performance, we combined the average ratings in several of these items for each school. Although the questions were not strictly identical, there was enough overlap in the content to consider them "conceptually equivalent" (Straus, 1969). However, to allow comparison between schools of an overall teacher's rating, it was also necessary to convert all scores to a common unit of measurement. We carried out a z-score standardization for this purpose by subtracting the mean for all courses in the college from the mean for a specific department and dividing the resulting figure by the standard deviation of ratings for the entire college. The resulting z-scores express the average teaching rating of a department in terms of the number of standard deviations which the department average is above or below the mean for all departments in the college.

FINDINGS

Table 1 indicates the relative ratings of several separate disciplines

Table 1 about here

and groups of disciplines for the sixteen universities and colleges.

In answer to the first question that we posed, sociologists are rated

below average as teachers by the students of fourteen of the sixteen colleges and universities studied as indicated by the negative z-scores. With an average weighted z-score of -.33, sociology is among the two fields receiving lowest scores on teaching, a nebulous distinction shared with psychology. On the other end of the continuum, teachers of the languages received consistently favorable ratings by students. They scored above average in all of the sixteen schools. They are followed in rank order by the humanities, other social sciences, professional schools, physical and biological sciences, sociology and psychology.

There appears to be some consistency between schools at the extremes of the continuum. It is unclear, however, if the variability in rank order for the intermediate disciplines represents real differences between schools or is the product of small sample variability.

DISCUSSION

Several alternative explanations for the pattern of findings are examined in this section although there is insufficient information to evaluate them fully.

1. Enrollment and Ratings. One striking thing about the findings is that the order of student ranking of teaching is either unrelated or inversely related to enrollment trends in different disciplines. But student ratings may be associated with differences in the average size of classes in different disciplines. We suspected that students tend to regard instructors of small classes more highly than they do instructors of large lecture classes to whom they may never have spoken directly. We found an individual Pearsonian correlation of -.10 between instructor rating and course enrollment (N = 4257, all disciplines combined). Moreover, for various reasons, the average class size in sociology and other social sciences tends to be large.[3] Thus, the negative correlation of class size with student ratings could be a factor underlying the low ratings of instructors in sociology.

Table 2. Average Course Enrollment by Discipline.

Discipline	Mean Enrollment Unweighted*	Weighted**
Languages	21.7	21.4
Humanities	39.1	44.2
Professional Schools	39.1	46.3
Sociology	51.4	66.0
Other Social Sciences	63.3	78.6
Physical and Biological Sciences	70.0	76.1
Psychology	83.8	103.8
All Disciplines	52.6	62.3

*N = 16 institutions
**N = 4993 courses

To test this explanation we computed the average class size for the seven fields. These figures are given in Table 2. The rank order correlation (rho)

Table 2 about here

between weighted average rating of instructors in each field and average class enrollment is .75. However, Sociology does not have as large class size on the average as the category Other Social Sciences and Physical and Biological Sciences, which rank higher in terms of student evaluations of teachers. Class size alone does not seem to be an adequate explanation for the low ratings received by sociology faculty.[4]

2. Content of Sociology. Students prefer learning in situations where they can clearly see their own progress. In language instruction, there is a clear and definite body of material to be learned and immediate feedback when each stage has been mastered. In contrast, in sociology it is often unclear what specific material the student is to learn and there is little clear cumulative progression between and even within courses. This explanation could account for differences between sociology and the languages but would not seem to account for the order of the other disciplines in Table 1. Psychology and the Physical and Biological Sciences being more precise should, according to this proposition, receive higher ratings than the Humanities, whereas the reverse is found to be the case.

3. Unmet Expectations. Many students are attracted to sociology because they want to change society. Many think of sociology as giving them specific prescriptions for reforming society rather than as a basic science which is concerned with explaining rather than changing society. Once in sociology, the courses and instructors fall short of these expectations and are rated accordingly more poorly than in other fields where expectations are more consonant with the actual contents and goals of the discipline.

Table 3. Rank Order of Faculty Ratings by Types of Sociology Courses, All Schools Combined.

Type of Course	N	Z Score*	
		Weighted	Unweighted
Theory	6	+0.53	+0.43
Statistics	5	-0.03	-0.03
Social Psychology	14	-0.03	-0.15
Other	81	-0.34	-0.29
Introduction	50	-0.35	-0.58
Methods	7	-0.56	-0.73
Social Problems	16	-0.63	-0.46

*Z scores are standardized to the school's mean and standard deviation.

A partial test of this explanation was possible by comparison of introductory courses with other frequently offered sociology courses. If large numbers of students enter sociology with an inaccurate view of its goals, then the dissonance should be greater within their first course than in subsequent courses. Consequently, we would expect much lower ratings for introductory courses.

The mean scores for faculty ratings in several types of sociology courses are presented in Table 3. The average rating of introductory courses of -.35 is

Table 3 about here

almost identical with the average z score of -.33 for all sociology courses combined. Instructors in this sample of introductory sociology courses are neither more nor less well received by their students than instructors in subsequent courses. This fact would seem to be inconsistent with the "unmet expectations" explanation.

The data in Table 3, however, do provide other insights. Three types of sociology courses receiving highest ratings are theory (for the most part history of sociological theory), statistics,and social psychology. These courses, especially statistics, have a fairly definite curriculum or more factual materials than most sociology courses. This "internal comparison" suggests some support for explanation #2 above which argues that it is the indefiniteness of the subject matter of sociology in comparison with other fields which leads to lower evaluations for sociology. This evidence is not fully satisfactory, however, since it is based on a comparison of types of courses within sociology rather than between sociology and other fields.

4. Lack of Career Relevance of Sociology. A distinctly lower proportion of sociology majors anticipate doing graduate work in sociology than do students in other fields. Davis (1965: 241) found that only 22 per cent of sociology

majors who were planning to do graduate work were planning to do it in sociology. Sociology ranked 30th among 33 fields in this regard. This means that most students in sociology courses, including majors, are not serious about the field as a future occupation. If students tend to view course work that is tied to their future occupational field more soberly, and if they tend to notice their intended-field professors' serious purpose and knowledge more readily and to acknowledge it with better ratings, then the sociology professor would tend to get lower ratings on this basis alone because of the low fraction of would-be sociologists in his courses.[5]

This explanation could account for the higher ratings received by teachers in professional schools compared to sociologists and possibly to the higher ratings of professors in languages and the physical and biological sciences. It would not account for the high ratings received by professors of the humanities since the humanities are probably even less vocationally relevant than sociology.

5. Selective Recruitment of Students. There may be highly selective factors in who enrolls in sociology courses and elects the sociology major which could affect the ratings of sociology instructors. On the one hand, sociology is now widely required of students in fields in which sociology has traditionally been held in low esteem, such as engineering and business. Such students may enter sociology courses with the idea that it is "a lot of bull." This group is more likely to be concentrated in lower division courses.

The sociology major also may contain a disproportionate number of alienated students whose alienation extends to the university and formal learning process itself. The disproportionate presence of all of these groups in sociology classes could adversely affect the ratings which sociology instructors receive. The latter factors could not be evaluated with the data at hand.

We have, of course, assiduously avoided the scientific error of psychological reductionism by not seriously considering the commonplace explanation that sociology faculty may not teach as well as their colleagues in other disciplines.

COURSE EVALUATIONS AS NORMATIVE EVALUATIONS

During the course of the analysis and interpretation, we began to view the student course critiques not only as technical evaluations of teaching but also as normative, i.e., moral evaluations of the extent of conformity or deviance of the teacher's role performance with student expectations. Low ratings accordingly could be viewed as an outgrowth of role conflict or unshared expectations regarding the instructor's role (and so, of course, could faculty evaluations of students).

We are not talking here about the expectation of thorough preparation, clear speaking voice, reasonably lively manner in the classroom, but rather basic conceptions of the nature of the teacher-student relationship that could affect the evaluation scores. Parsons' pattern variables" (1951: 58-67) are below for examining the nature of the normative conflict in certain aspects of faculty-student relationships.

1) Affective vs. Affective Neutrality. There is good reason to believe that a higher proportion of students than faculty feel that the ideal relationship with their instructors should have a good deal of affective content. Evidence from one study has shown that the overall student rating of a faculty member corresponds directly to the amount of positive supportive comments which the instructor makes in the classroom (Flanders, 1964).

2) Diffuse vs. Specific. A higher proportion of students also would seem to favor a student-faculty relationship more toward the diffuse end of the continuum whereas faculty might be assumed to be more toward the specificity end of the continuum. We suggest that faculties' conception of the student-faculty relationship tends to be more oriented toward the students' mastering the subject matter of the course. Factors such as availability of the teacher outside the classroom and his interest in the "total student" may be much appreciated and sanctioned by higher evaluations on the part of the students.

3) Achievement vs. Ascription. There is evidence of a growing role conflict on the achievement-ascription axis in faculty-student relationships. Marvin Bressler in a talk before the Eastern Sociological Society entitled "Changing Collegiate Education" (1971) referred to the growing trend among college and university students of avoiding evaluation of their own performances. This takes the form of pressures towards such "innovations" in grading procedures as pass-fail, credit-no credit, pass-no fail, etc. Bressler interprets this trend as evidence of an elite group attempting to protect its relatively privileged position from competition.

This trend also manifests itself in the decreasing number of failing grades awarded and the creeping inflation in cumulative grade point averages that are occurring on some campuses and the extremely high proportion of the student body that are now graduating with honors. This trend has occurred at a point in time when an historically high proportion of high school students are admitted to college. Thus, in some sense the college has taken on some of the characteristics of the junior college that Burton R. Clark described over a decade ago as a "place where everyone is admitted and everyone succeeds" (Clark, 1960:576).

4) Universalism vs. Particularism. There is a feeling on the part of many students that instructors should respond to students as unique beings and should

grade them on the basis of the students' own personal goals rather than on the basis of universalistically applied course goals.

Closely related to this area of conflict is concern by students that faculty value their opinions. Sociologists are especially vulnerable on this score since they are already geared toward convincing students and the general public that their own common sense or individual experience are poor guides to an objective view of social life.

5) Collectivism vs. Individualism. This dimension may be especially relevant for the evaluation of sociology professors. One reason for rejection of sociology faculty by some students is the conflict between the "value-free, natural science approach" favored by many sociologists and the approach favoring direct social action to bring about social change favored by many students. We believe that the latter position is identified by students as humanistic and unselfish while the pure science orientation is seen as largely a hedonistic pastime, if not actually a self-serving device in not challenging the status quo. The accuracy of all of the above judgments is, of course, debatable.

The above pattern variables may be formed into a set of ideal types with regard to the faculty-student role relationships. The combination, for example, of affective, diffuse, particularistic, and ascribed normative orientation could be thought of as the "student-oriented" teacher role. The opposite axis comprised of affective neutrality, specificity, achievement and universalism could be thought of as defining the "discipline-oriented" teacher role.

There are, of course, other possible dimensions of role conflict that might exist between teachers and students but the above should suffice to point out the considerable areas of apparent conflict which undoubtedly affect student evaluations of faculty. It would be perhaps easy (and we believe wrong) to interpret the faculty ratings by students completely within the context of role conflict.

There are faculty on any campus whose conceptions of the faculty role are quite unlike those of students' as described here, yet who achieve highest student ratings. Undoubtedly, there is also a range of evaluations for those professors who share the normative standards of students. We would hypothesize, however, that the average rating of faculty who share normative standards with students would tend to be higher than those of faculty who hold different standards. If this is the case then a major problem with the course critique as an index of classroom teaching is that it confounds within a single measure the students' evaluation of role performance and the role consensus between faculty and students. One needed step in advancing research on classroom performance is measuring teaching performance and normative evaluation independently.

If role conflict of the kind we have been discussing exists, it could account for the patterns of differences in student ratings of faculty by field only if the amount of role conflict also varies by field. There is indeed evidence that such differences in role conflict do exist. Lionel Lewis (1967) conducted a survey comparing the attitudes toward the importance of undergraduate teaching, graduate teaching, and research among faculty and students in four different disciplines. The greatest difference found between faculty and student views are in the social sciences, especially with regard to research. Seventy-nine per cent of faculty in social sciences feel research is very important compared to only forty-nine per cent of students. The gap between the views of students and faculty is least within the humanities with sciences and engineering falling mid-way. Lewis' findings support a role conflict interpretation of differences in ratings by field, although they do not specifically pinpoint the situation of sociology.

SUMMARY AND CONCLUSIONS

A survey of student evaluations of teaching covering 16 colleges and universities revealed that sociologists are rated well below average as teachers, compared with their colleagues in other disciplines. In a comparison of seven fields, Sociology shares the lowest ranking with Psychology. The rank order of the other fields is (from highest to lowest rating): Languages, Humanities, Other Social Sciences, Professional Schools, and Physical and Biological Sciences.

Good teaching has been regarded almost exclusively as a characteristic of individual teachers and research on teaching has concentrated on individual correlates of teaching performance. If we were to follow this tradition, we would conclude that teachers of sociology and psychology, as individuals, are less competent than teachers in other fields. This may well be true. But if it is true, it is only part of the explanation. In this paper we put forth several alternative explanations: (1) The large class sizes characteristic of sociology courses produce student dissatisfaction. (2) The indefiniteness of the content of sociology makes it a less satisfying experience for some students. (3) Student expectations for sociology as a means of transforming rather than understanding the world produce unmet expectations. (4) Sociology has low relevance for students' future occupational goals. (5) Selective recruitment draws into sociology alienated students.

Some support was found for each of these explanations but none of them appeared fully adequate based on the limited data available in this study. Nonetheless, the current findings suggest as a minimum that teaching performance is, in part, a positional attribute which is distributed across universities in definite patterns. The explanations summarized above indicate some of the factors creating these positional effects. In addition, we suggested that more general types of discrepancy exist between the norms held by students and those

held by teachers concerning appropriate roles. We believe that future research on factors affecting the teaching of sociology should explicitly measure these normative discrepancies. Our concluding discussion, which makes use of Parsons' pattern variables, suggest that his taxonomy of norms may provide a set of concepts which will facilitate empirical study of the normative-conflict aspect of sociology teaching.

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FOOTNOTES

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1. School descriptions (letters keyed to Table 1).

A. Eastern Catholic urban college

B. High prestige private urban undergraduate college, in a university

C. Eastern Canadian urban university

D. Major campus of the University of California

E. Mountain state university

F. Large "big ten" state university

G. Large private urban western university

H. Large "big ten" urban state university

I. High prestige eastern urban college of university

J. Major urban campus of an eastern state university system

K. High prestige private urban undergraduate college in a university

L. Southwestern state university

M. Southwestern state university

N. Western state university

O. Western state university

P. New England state university

2. A copy of the specific questions used for each school may be obtained from the National Auxiliary Publication Service by requestion document number _____ and remitting $1 for a microfiche copy or $3 for photocopies to: ASIS-National Auxiliary Publications Service, c/o CCM Information Sciences, Inc., 22 West 34th Street, New York 10001.

3. In part this difference is because instruction can only be carried out in small groups in fields such as languages. But it may also reflect difficulties in adjusting to changes in enrollment patterns. Our impression is that enrollments have tended to be stationary or falling in the languages and humanities while rising rapidly in some of the social sciences such as psychology and sociology. On many campuses, additions to faculty have not kept pace with the rise in enrollments because of institutional lag and because the enrollment shift has occurred during a period when universities have been undergoing severe budgetary pressures. As a consequence, student-faculty ratios may have become larger in fields such as sociology relative to fields with slower growing enrollment. Large class size in turn may be correlated with lower student evaluations. According to this reasoning, fast enrollment growth in a discipline would be linked to lower teacher evaluations. Conversely, slow growth would be linked to lower teacher-student ratios, smaller classes and higher student ratings.

4. Most course critiques used in the study are based on data for a period approximately four to five years ago. This may have anti-dated the rush into sociology courses which we have experienced recently.

5. This explanation of our findings was suggested to us by Wagner Thielens, Bureau of Applied Research, Columbia University.

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STUDENT EVALUATIONS AND RESEARCH PRODUCTIVITY AND EMINENCE OF COLLEGE FACULTY

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The relationship of a professor's classroom performance to his involvement in research has been hotly argued both inside and outside of the academic community. Discussions of this problem, however, have been largely polemical. The issue has not received the same careful empirical study and scholarly analysis which faculty have brought to the study of other problems. This study provides empirical data on the relationship of the different dimensions of academic competence. For purposes of the research, we assume that there are two main components of academic competence: high performance as a teacher and high performance as a research scholar.

The major problem may be expressed in terms of the following four-fold table, although the dimensions are actually continuous.

Research and Scholarship	Teaching Quality: High	Teaching Quality: Low
High	good teacher good researcher a	poor teacher good researcher b
Low	good teacher poor researcher c	poor teacher poor researcher d

There are at least three basic possibilities regarding the relationship of teaching and research abilities.

a) Teaching and research ability are positively correlated, i.e., good researchers make good teachers while poor researchers make poor teachers. (Faculty would tend to be concentrated in cells a and d in the above figure.)

b) Teaching and research abilities are oppositely related -- good researchers make poor teachers and good teachers make poor researchers. (Concentration of cases expected in cells b and c.)

c) Teaching and research abilities are independent. (Approximately as many cases in cells c and b as there are in cells a and d.)

There would seem to be ample rationale for either a positive or a negative correlation between teaching and research, or no correlation. The arguments supportive of each of these three positions are presented below.

a) Positive correlation. Two ways in which a positive relationship between teaching and research could be explained are a "spill-over" effect and a general "A" (ability) factor. 1) When one of the two activities directly influences the other, then a spill-over effect may be said to have occurred. Thus, research participation may contribute to an intensive involvement with one's subject matter. The sense of excitement through participation in the creation of knowledge may also be communicated to students as well as the idea of knowledge as a living, growing thing. A spill-over effect in the other direction, i.e., from teaching to research would also be consistent with a positive correlation between teaching and research performances. Highly involved and stimulating teaching could produce strong feedback from students which could lead to productive lines of research. In both cases, the roles are basically

supportive of one another. 2) A positive correlation could also be due to the fact that teaching and research performances are both reflections of a general ability factor. Ability tends to be generalized and it may be that those who teach well and are productive scholars also tend to be better than average performers within their academic roles such as committee work and probably non-academic roles as well.

b) Negative correlation. Teaching and research may be oppositely related because the roles interfere with one another. Only so much time and energy is available to any one person and commitment to either one prevents the development of excellence in the other role. Teaching success may also depend upon personality attributes such as gregariousness and liking of people that tend to be inversely correlated with personality attributes associated with research success, such as intellectuality.

c) No correlation. Teaching and Research on the whole neither support nor detract from the other. The skills involved are in fact randomly distributed among college professors making any one combination as likely as any other.[1]

PREVIOUS RESEARCH

Our search of the literature uncovered a great many items dealing with college teaching, including forty-six articles which specifically deal with the relation of teaching and research, often in the form of discussion of the "publish or perish" issue. Of these forty-six, only nine are empirical studies, i.e., studies reporting systematic data on a sample of professors.

A closer look at even these seven highlights the need for research on this issue. One study is grossly defective in design (Frumkin and

Howell, 1954). These investigators secured nominations of good and poor teachers from students. They selected (by unstated methods) one good teacher and one poor teacher and compared them on a number of characteristics, including research publications and found no difference. At the other extreme, Maslow and Zimmerman (1956) found a correlation of about +.50 between colleague ratings of creativeness and teacher performance ratings, based on ratings by both students and faculty of 26 professors at a large municipal college. Unfortunately, we do not know the extent to which ratings of creativeness are indicative of actual research performance, and we suspect that these ratings are influenced by teaching performance, thus producing a spuriously high correlation. In any case, no other study has found correlations of this magnitude.

Similar methodological problems arise in connection with other studies. McGrath (1962) reports data on 62 liberal arts college teachers and concludes that the "typical outstanding teacher publishes." However, to measure teaching performance, McGrath used judgements by administrative officers, and these are likely to be contaminated by the administrators' knowledge of the professor's research performance. This problem is also present in the study by Woodburne (1952) which compared a group of thirty-two "superior" faculty members at a Midwestern state university with a random sample of thirty-two others. Classification into the superior group was based on rapidity of promotion. Ratings of teaching performance were "outstanding or effective" for seventy-two percent of the superior group but only forty percent of the random sample of faculty (these

percentages would be roughly equivalent to a correlation of .40). As for scholarly publication, the superior group had roughly double the rate of the others so that, if Woodburne had computed the correlation between the two areas of academic competence, he would probably have found a moderate size positive correlation.

Woodburne's research also can be used to illuminate the more elusive problem of understanding the reasons for the positive correlation because he presents data comparing the superior group with other faculty on certain other variables: honors as an undergraduate and as a graduate student, colleagues' ratings of mental acuteness and originality, and industriousness. On all of these, the scores or ratings of the superior group greatly exceeded those of the random sample of faculty. These findings support an explanation based on what we have called a "general ability" factor: the superior academic tends to do most things better than others. However, as previously noted, these relationships may be spurious since they are based on judgments of colleagues and administrators, and these judgments might be influenced by their knowledge of the outstanding research performance of the superior group. In fact, Austin and Lee's study of faculty evaluation procedures in 1,000 colleges and universities (1966) states that in general, teaching ability is judged by research ability. Consequently, it is possible that, despite the correlations just cited, the "true" correlation between competence in the teaching role and competence in the research role is actually zero. A clear answer to this question

can only be obtained if the measure of teaching performance is obtained completely independently of the measure of research performance. None of the studies so far reviewed meet this critical requirement. But four other studies do. Unfortunately, the findings of these four studies disagree. McDaniel and Feldhusen found that first listed authors of books or of papers were rated slightly lower as teachers than their colleagues. The correlations between teacher rating and books was $r = -.13$ and for articles $-.10$ (McDaniel and Feldhusen, 1970).

Voeks (1962) used student ratings of 305 University of Washington faculty as a measure of teaching performance and membership of a faculty member in the university research society as the measure of research performance. No relationship was found between the two measures. On the other hand, Bresler (1968) related student evaluations of 130 Tufts University professors to research performance measured by whether or not the faculty member had received a research grant. Bresler found that those whose research was meritorious enough to receive a grant also had higher average ratings for their teaching.

The fourth study by Stallings and Singhal (1970) covered two "Big Ten" universities, Indiana University and University of Illinois. They used as data published student course critiques for both campuses. They compiled a Research Productivity Index from a bibliography of publications of the faculty of these campuses.

For University of Illinois, they found a small statistically

significant relationship between course evaluation scores and research productivity (r=.26). For Indiana University, a low positive relationship was found (.13) between the Research Productivity Index and overall course scores and instructor rating.

Given the fact that a search of the extensive literature on the relations between competence in research and competence as a teacher produced only four studies which meet even the minimal technical requirements for adequacy of data, and given the fact that these studies are in disagreement, it seems clear that further research on this important issue is needed.

PROCEDURES

Essential data for the study were already available although they had been gathered originally for other purposes. Ratings of classroom performance of teachers is derived from the series of "course critiques" published by a large number of universities and colleges during the last five or six years. These course critiques could be criticized on the grounds that they represent only one perspective on classroom performance, i.e., the student's. However, the few empirical studies of student ratings suggest that they have a high degree of reliability, are relatively independent of the grade received by the student (Voeks, 1962) but <u>are</u> related to the number of students who take additional courses in a department, i.e., a larger proportion of students in sections taught by professors with high ratings took additional courses in the field

and Kimble, 1968).
(McKeachie, 1958; McKeachie/ One need not be committed to the complete validity of the student course evaluation to recognize their importance as an index of student reactions to teaching. Without downgrading other types of evaluation, composit judgements of large numbers of students must be taken into consideration in evaluating teaching performance.

The present study is based on data from sixteen schools.[2] Essentially, this is an "availability" sample of universities selected on the basis of whether a course critique useful for our research was published. (If, for example, ratings were not quantified, we were not able to use them.) However, the sample includes within it various types of colleges and universities including large and small, public and private, prestigious and less distinguished institutions. Hence, findings of the study should provide a better basis for generalization that any study done at a single school. The sample on the whole is over-representative of larger and better known universities. The "bias" of the sample may actually aid the validity of the study in this case. If teaching and research are uncorrelated for this population of relatively "high powered" institutions, then it is very unlikely that they would be correlated in other institutions in which research is not a major goal.

The set of Teaching Evaluation questions on which students were asked to rate professors and courses varied with each of the schools compared. Usually, we had information on approximately ten items on each professor. To get an over-all rating of professors' classroom

teaching performance, we combined the average ratings on several of these items for each school. Although the questions were not strictly identical, there was enough overlap in the content to allow comparison between schools of an overall teacher's rating.[3] Where faculty were listed for more than one course, ratings were averaged. Some of the individual items that went into the overall rating are also treated separately in the analysis where possible, since they relate to substantially different aspects of teaching performance such as instructors' "personalization" and "course content."

Since the analysis to be reported in this paper involves the ratings of faculty in 16 different colleges, it was also necessary to convert all teaching scores to a common unit of measurement. For this purpose, we carried out a z-score standardization by subtracting the raw score for each faculty member in a college from the mean score for that college or university and dividing the resulting figure by the standard deviation of ratings for the entire college. The resulting z-scores express the teaching rating of a faculty in terms of the number of standard deviations which he is above or below the mean for all faculty in his college.

Data on the "nonteaching role" of each professor are limited to two measures of research and scholarship.

A Publication Score was computed based on a weighted summary score for articles and books written over an approximately 20 year period.[4] (Straus and Radel, 1969). This score was limited to eight disciplines

because of the enormous amount of time required to complete the bibliographical search for each discipline: One applied field, Engineering; one physical science, Physics; one biological science, Biology; two humanities, English and Philosophy; and three social sciences, Anthropology, Sociology and Psychology.

A Citation Score was based on the number of times a scholar's work was cited by others over a ten year period. It is felt to reflect the scholarly impact rather than output. The data were obtained from the Science Citation Index. This measure was limited to the fields for which publication data were compiled and which were covered by the Index. Hence English and Philosophy are omitted from the Citation Scores.

Other variables included in the study are course level, instructor's rank, degree, years since completion of the Ph.D., course enrollment, course level, and prestige ranking of institution from which instructor received his highest degree (Cartter Ratings).

TEACHING EVALUATION AND RESEARCH PRODUCTIVITY

Data on the relationship of student evaluations of teaching to a number of other variables including research productivity are given in Table 1. Several measures of each variable are included(Curtis and Jackson, 1962). Data indicate a high degree of independence between teaching and research performance.

The first row of Table 1 shows that the overall Teacher Rating correlates only .04 with Total Publications Score. Even with 1422

Table 1. CORRELATION (r) OF SELECTED INDEXES OF TEACHING AND RESEARCH PERFORMANCE

Indexes of Teaching Performance	Measures of Research Performance: Total Publications	Articles	Ed. Books	Joint Books	Solo Books	Citation
Overall Teaching Rating	.04 (1422)	.02 (1423)	.03 (1436)	-.01 (1439)	.05* (1439)	-.05 (760)
Course Content	.12* (302)	.11* (302)	.18** (304)	.03 (303)	.10* (304)	.16* (159)
Instructor's Personalization	-.05 (1046)	-.05 (1047)	.00 (1055)	-.03 (1059)	-.04 (1058)	-.07* (578)
Instructor's Knowledge	.27** (333)	.22** (333)	.24** (332)	.09 (334)	.17** (334)	.07 (185)
Course Coherence	.03 (512)	-.04 (512)	.06 (520)	-.10** (523)	.15** (523)	-.10* (293)
Instructor's Interect in his Subject	.07 (83)	-.04 (83)	.13 (84)	.30** (84)	.20* (84)	.07 (53)
Motivates Students	.00 (943)	-.04 (943)	.06* (954)	.00 (955)	.05 (955)	-.11** (524)
Value of Readings	.06* (1080)	.00 (1081)	.04 (1094)	.01 (1095)	.12** (1095)	-.02 (581)
Exam Quality	.00 (974)	-.02 (975)	.00 (985)	.00 (989)	.01 (988)	-.07* (585)
Value of Papers	.12* (264)	.07 (265)	-.01 (265)	.08 (266)	.16** (265)	-.06 (98)
Fairness	.02 (430)	.04 (430)	.05 (439)	.07 (440)	.06 (440)	-.07 (232)
Recommend Course	.10* (308)	.17** (308)	.04 (306)	-.05 (308)	.07 (308)	.09 (170)

[1] Number of courses varies since data was not available on some variables for all subjects.

* = $p < .05$; ** = $p < .01$

Table 1 About Here

cases, it fails to be statistically significant. This overall measure of teaching also fails to show much pattern with any of the four separate components of the publication score and may even be negatively correlated with the independent Citation Score.

Publication and citation do seem to be correlated with students' evaluation of the Instructor's Knowledge (line 4). The rating for Instructor's Knowledge is correlated .27 with Total Publications and there also appears to be small positive correlation with the other indeces of research performance. Research performance is also consistently correlated with students' evaluation of Course Content (line 2) although all correlations are small. Students are also slightly more likely to recommend a course taught by "productive" scholars than by others, although the correlation is not significant.

The variables of Course Content and Instructor's Knowledge can be grouped conceptually under "intellectual competence" in the teaching role. Hence, there is a certain "face validity" in their correlation with scholarship. On the other hand, Instructor's Personalization or the degree to which he seems personally responsive to students inside and outside the classroom, appears to be negatively correlated with research performance, if anything.

Although certain of the correlations in Table 1 indicate meaningful patterns of association, the absolute value of all these correlations is generally low. We can therefore conclude that there is little correlation between performance in the teaching and research roles, at least as measured here.

Table 2. CORRELATIONS BETWEEN TEACHING RATINGS AND SELECTED OTHER VARIABLES

Indexes of Teaching Performance	Course Level	Enroll-ment	Rank	Highest Degree	Ph.D. Years	Cartter Rating
Overall Teacher Rating	.09** (4646)[1]	-.10** (4257)	.00 (3530)	-.06** (2758)	-.08** (1729)	-.04* (2172)
Course Content	.13** (1126)	-.01 (882)	.09** (905)	.05 (332)	-.11** (424)	-.05 (594)
Instructor's Personalization	.10** (3443)	-.22** (3015)	-.08** (2549)	-.09** (2351)	-.05* (1303)	-.05* (1740)
Instructor's Knowledge	.17** (1180)	-.03 (1151)	.25** (1093)	-.07* (417)	-.04 (601)	-.02 (696)

[1] Number of cases varies since data was not available on some variables for all subjects.

* = $p < .05$; ** = $p < ..01$

TEACHING RATINGS AND OTHER SELECTED VARIABLES

If there is little or no correlation on the average between research productivity and student evaluation of teaching, what then is teaching evaluation correlated with? In this section, several other factors are considered including situational variables and professor's background.

1. Situational Variables

Course Level refers to whether the course is intended for freshmen, sophomores, juniors, seniors, or (in a few cases) graduate students. The first row of Table 2 shows a small positive correlation (.09, N=4646), between

Table 2 About Here

overall teaching rating and course level. The Enrollment or class size relates oppositely to overall teacher rating (-.10, N = 4256). The negative association with Enrollment is somewhat stronger when Instructor's Personalization is used as a measure of teaching performance (-.22, N=3015) than with overall teacher rating. Thus, those professors who teach upper division or smaller enrollment courses (there is considerable overlap here as indicated by a correlation of -.23, N=3936 between course level and enrollment) are more likely to receive favorable evaluations from students than their colleagues in lower division and larger enrollment courses.

Thus, faculty evaluation by students is to a large extent positional since faculty assigned to teach upper division, advanced

courses are more likely to be given high evaluations by students in these courses. It is interesting that faculty also rate students more highly in advanced courses than in lower level courses as evidenced by higher grades assigned on the average to students in upper division courses and the increasing grade point averages from Freshman through Senior year. This could mean that both faculty and students more closely meet one another's expectations at this level than at the lower levels.

The relationship of academic field to student course evaluations was discussed in an earlier paper by the authors (Linsky and Straus, 1971). Teachers in the Languages received on average highest ratings (z=+.25) followed by Humanities (z=+.13), Other Social Sciences (z=.07), Professional Schools (z=-.08), Sociology (z=-.33), and Psychology (z=-.36). From this data, it would appear that teacher ratings are only partly due to individual differences in teaching abilities but also it is a positional or situational attribute.

2. Personal Characteristics

Academic Rank is uncorrelated with overall teaching score (r=.00, N=3530). However, rank is positively correlated with some of the separate components of the teaching score, with students' evaluation of course content (r=.09, N=905) and with instructor's knowledge (r=.25, N=1093). Students evidently attribute high degrees of knowledge to higher ranking professors. Whether this represents a "halo" effect created by the foreknowledge of the professor's rank or an unbiased

or blind judgment on the part of students can not be ascertained from the data.

Rank seems to be definitely correlated with publication score (r=.39, N=1065) and citation score (r=.24, N=563). This would seem on first glance to provide some support for the "publish or perish" hypothesis of academic success. However, the strongest correlation between rank and any other variable is with the number of Ph.D. years or length of service (r=.63, N=1735). Thus, even the group of highly competitive universities and colleges represented in the sample reward people on the basis of seniority or length of service. A more accurate description of the typical academic career than "publish or perish" might be "remain and rise."

Highest degree held appears to be somewhat oppositely or unrelated to teaching rating (r=-.06, N=2758). Thus, although advanced degrees are regarded as an extremely important index of faculty qualifications on the part of University Administrations, their views are not shared by their students.

Classroom performance would appear to decline over the course of a teacher's career as indicated by the correlation between teacher rating and Ph.D. years of -.08, N=1729. It must be kept in mind that this is not longitudinal data but reflects persons at different stages of their career at a point in time. In addition, some of our data suggest that the low correlation masks a much higher but curvilinear relationship. That is, classroom performance is seen by students as

as initially low, improving for a time, then plateauing and later declining.

Prestige of the University from which faculty have received their degrees is not positively associated with student's evaluation of classroom perfo.mance. It is either unrelated or there is an extremely small negative correlation.

IMPLICATIONS

Although the findings are clear, the implications are conflicting given the dual commitment of at least most colleges and universities to both teaching and research activities.

a) One implication is that there would seem to be some value in developing more independent reward systems for teaching and for research than currently exist, since at best they are only weakly correlated. There is apparently no reason why the same goals could not be obtained by allowing a greater "division of labor" with faculty specializing in either research or teaching without career penalties.

b) A second and seemingly contradictory implication is that universities hire primarily according to promise as a researcher will get a greater overall return for their money since such research productive faculty are on average at least as good teachers as those not partaking in research.

c) If the goal of an institution is only teaching, and research is seen as either unimportant or as instrumental to producing good teaching,

then there is little point to take research productivity into account in hiring or promoting, since these data suggest that research is not necessary for good teaching, at least as rated by students.

d) A further implication is that universities that are sufficiently competitive should recruit faculty who are outstanding in both teaching and research dimensions of the academic role. Being good in one is certainly no bar to being good in the other respect. Since this combination of being high in both teaching and research is as common as any other combination of these traits, it should be well within the limits of possibilities.

Qualification of Findings on Teaching-Research Relationship. These findings describe the general or average relationship between teaching and research performances within sixteen schools and across a variety of disciplines. As such, it represents the most complete study to date of the relationship between teaching and research. As it is based entirely on zero order correlations, it does not consider the effects of other variables which could effect the relationship. For example, does the same relationship hold between teaching and research in the humanities as in the physical or social sciences? Are these two aspects of the professional role related differently in high prestige and in other schools? Does the relationship vary between universities with graduate schools and small undergraduate colleges? Also, what is the form of the relationships? Is it actually curvilinear or linear? What is the effect of statistically removing the effects of third

variables on the basic relationship? For example, how is the correlation between teaching and research performance effected by number of years since Ph.D.? It is quite possible that as faculty members are more and more removed in time from their experience as a graduate student, research plays a greater role in stimulating a person to keep up with the literature and to maintain a high level of enthusiasm and involvement in his field. These are some of the needed elaborations of the relationship which we plan to undertake.

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FOOTNOTES

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1. Phillip E. Hammond et al., argue that opposing beliefs about whether teaching and research are positively or negatively correlated have a social structural basis. Only selective information is available and salient for people located differently in the social structure of the university (Hammond, Meyer and Miller, 1969).

2. The schools are Boston College, Columbia College, Barnard, McGill University, University of Southern California, Yale, University of Minnesota (Duluth), SUNY (Buffalo), University of New Mexico, University of California at Los Angeles, University of Texas (Austin), Ohio State University, University of Wasnington, University of Utah, University of New Hampchire.

3. A copy of the specific questions used for each school may be obtained from the National Auxiliary Publication Service by requesing document number and remitting $1 for a microfiche copy or $3 for photocopies to: ASIS-National Auxiliary Publications Service, c/o CCM Information Sciences, Inc., 22 West 34th Street, New York 10001.

4. An individual's publication score was computed as follows: 1 point for each article (whether sole or joint author); 2 points for an edited book; 4 points for a jointly authored book; and 6 points for a solely authored book.