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ABSTRACT

This paper summarizes a May 1972, study of the relationship between teaching and research in seventeen University of Washington departments. The study sought correlations among the following: (1) Research reputation, measured by departments' ratings in the most recent American Council on Education's rating of Graduate Programs. (2) Departmental operating data, including allocation of faculty time between teaching and research. (3) Departmental teaching quality, measured by a specially-prepared student rating instrument that included items on the incorporation of research into teaching. Major results were as follows: (1) No overall relationship between research reputation and teaching quality was found. This appeared to be the result of departmental and subject matter differences in the relationship between research and teaching. (2) Teaching quality and percentage of time spent by teaching faculty in research were found to be negatively correlated. (3) Student ratings on the research-oriented items improved as the level of instruction advanced. (Author)

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RESEARCH REPUTATION AND TEACHING QUALITY IN UNIVERSITY DEPARTMENTS

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A favorite topic for conjecture on university campuses is the relationship between research and teaching, and whether university instructors should be required to combine research and publication with teaching. Whether their concern is quality teaching, quality research, tenure requirements, or the allocation of scarce resourses, this issue is debated by faculty, students, administrators, trustees, legislators, and taxpayers.

Studies of the relationship between research and teaching have provided little support for either side of the debate. Voeks (1962), Stallings and Singhal (1970), and Hayes (1971) all

found no significant relationship between publication rate and student ratings. Only Bresler (1968) found a positive relationship between research and teaching: at Tufts University, faculty who had received research grants received higher student ratings than those who had not. And the most recent review of existing research and opinion clearly presents the need for further inquiry (Page, 1972).

Measure of Research Reputation

This study differs from the earlier research mainly in that we examined the research productivity and teaching quality of departments, rather than of individual faculty members. The measure of departmental research reputation was from the most recent American Council on Education Rating of Graduate Programs (Roose and Anderson, 1970). Since a department's A.C.E. rating is based upon a nationwide survey of scholars in that field, it is essentially a measure of the quality and the quantity of research conducted by the faculty of the department.

The data provided in the A.C.E. report enabled us to devise two systems for ranking University of Washington departments according to research reputation. In the first (or raw score) system, the departments were ranked according to the percentage of respondents who ranked the department's faculty as distinguished and strong. The second (or percentile) ranking system was based on each department's relative rank among the other departments of that

discipline across the country. For each of the seventeen University of Washington departments, we calculated a national percentile score, and then the departments were ranked on the basis of this score.

The difference between the two ranking systems is that in the raw score system, University of Washington departments were compared with each other directly, whereas in the percentile system, the departments were compared first with their field nationally, and then with the other University of Washington departments. The purpose of the percentile ranking system was to reduce possible differences in the generosity of raters among the various disciplines.

We also gathered departmental operating data, which served as additional indicators of departmental research activity. This included (among other data) the percentage of faculty time spent on research.

Table about here

Measure of Teaching Quality

To measure teaching quality, we designed a new student rating form. Since we wanted to insure maximum agreement on the meaning of a response, we employed a format of scale descriptors to aid the respondent.

Illustration about here

The choice of items was determined by our desire to keep the instrument short while accommodating two kinds of scales: those that measured the incorporation of research into teaching, and those that measured the generally-accepted attributes of good teaching. The research-oriented scales were: Knowledge of Subject, Currentness of Material, and Use of Own Research. All of the research scales and most of the general scales were chosen from those that discriminate well between the best and worst teachers (Hildebrand, et al., 1971).

Sample

From a list of individual programs of studies provided by the Registrar, 1106 students taking courses in the seventeen departments were randomly selected to receive the rating form. Returns were received from 58% of the sample; therefore, our analysis was based upon 643 student ratings. To protect the anonymity of individual instructors, the returned rating forms were identified only by department and level of instruction.

Results

Using first the raw score ranking system, rank-order correlations were calculated between A.C.E. ratings and mean

student ratings on all items, and between A.C.E. ratings and mean student ratings on the research items alone. The correlations were .16 ($\bar{X}_{1-8}$) and -.07 ($\bar{X}_R$)--both insignificant. Having found no overall correlation between research reputation and teaching quality, we then compared departments by field of study. For the social sciences alone, we found a slight positive relationship between A.C.E. ratings and student ratings on the research-oriented items. This suggested that for the social sciences, at least, departments with greater research reputation may incorporate research into instruction more than those of lesser reputation.

We next calculated the rank-order correlation between A.C.E. ratings and student ratings, using the percentile ranking system. This time, we found slight negative correlations: -.37 ($\bar{X}_{1-8}$) and -.56 ($\bar{X}_R$). The negative correlation between national percentile ranking and student ratings on the research-oriented items was statistically significant at the .05 level. This suggested that those departments which had the highest relative rank in the country were perceived by students as incorporating research into teaching to a lesser extent than those with lower relative ranking.

When the data were analyzed in an attempt to account for this finding, we discovered that the major contributors to this negative correlation were the physical sciences. For example, Math and Physics were tied for second in percentile rank, yet received nearly the lowest student ratings on the research-oriented questions.

This finding, together with the slight positive relationship found for the social sciences in the raw score ranking system, led us to conclude that there might be significant differences in the research-teaching relationship among the various fields of study as well as among departments within fields. It is also possible that these relationships are obscured when all departments are combined together for analysis.

The differences in the research-teaching relationship among various fields of study appear to be the result of three major subject matter differences. First, subject matters differ in characteristic type of research (ranging from experimental to general scholarship) and in the extent to which incorporation of research into classroom instruction can be recognized and evaluated. For example, in the social sciences, research is generally experimental or descriptive. Methodology is stressed and studies are always referred to by author, so it is highly unlikely that a professor could refer to his own work without a student's being aware of it. In literature or philosophy, however, students are unlikely to know whether an idea presented by a professor came off the top of his head, from notes he took in a graduate seminar, or was the result of scholarly research.

Second, subject matters differ in the size of the gap between undergraduate and graduate level of understanding. For example, current research in psychology or sociology can usually be understood by students even in introductory classes, whereas it would be very difficult to explain the latest research in physics to beginning physics students.

Related to this are subject matter differences in the size of the gap between the educational needs of the generalist and specialist. Here again, the gap in the social sciences appears to be smaller than that in the physical sciences. For example, the latest research on cognitive dissonance may help the freshman in a survey course to better understand his behavior, whereas the latest research on neutrons is of doubtful relevance to the nursing student taking a "service course" in chemistry.

As a result of these findings, we feel that future studies of the relationship between research and teaching need to be undertaken at the subject matter level, by specialists in that field with specialists in institutional research. Such studies might compare departments across several universities. One of the less complex variables to examine is time. For example, in this study we examined by department the relationship between quality of teaching and the percentage of time spent by teaching faculty in research. A negative correlation was found. As the regression lines below indicate, this relationship was almost identical for teaching quality as measured by the means of all items ($\bar{X}_{1-8}$) and that measured by the means of the three research-related items ($\bar{X}_R$).

Figure about here

Conclusion

In closing we emphasize the tentative nature of our findings and urge that more delicate and sophisticated analyses be undertaken. Some of the factors to be considered have been suggested by this study. However, several additional considerations need to be taken into account in future studies of research and teaching. The first of these is the difference in kind of research that may be undertaken. Basic research, applied research, and research on educational problems may all have different effects on teaching.

A second consideration is that in order for research to have a beneficial influence on teaching, it is not necessary that either research quality or quantity be correlated with teaching quality. Instead, it is only necessary that the teaching quality of those engaged in both teaching and research be higher than it would be, were they only teaching. Thus, rather than comparing teaching quality of faculty in the dual role, future studies might compare the teaching of university teachers with that of full-time teachers at other institutions of higher education.

Finally, given the subtle interdependence of research and teaching and the adherents to doctrinaire positions for and against the present system of dual roles, great care is required in the presentation, interpretation, and discussion of the results of future studies. Offending the sensitivities of defenders of the status quo might provoke unfortunate resistance to any improvements that might be indicated a a result of such studies.

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Illustration

SCALE FOR STUDENT ASSESSMENT OF TEACHING

The following scale consists of qualities which instructors may possess to varying degrees. Please rate the instructor of the course listed above on each of the qualities. Each quality is divided into three sections, and each section into three degrees, numbered accordingly from 1 to 9. In rating, circle the number which best describes your instructor.

	1 2 3	4 5 6	7 8 9
ENTHUSIASM FOR SUBJECT	Is definitely enthusiastic about subject matter of course.	Is at times enthusiastic about subject matter.	Seems to teach course without enthusiasm.
KNOWLEDGE OF SUBJECT	Definitely an expert; well-read and experienced.	In good command of subject matter.	Unsure of subject matter; not well-read.
TOLERANCE	Encourages and accepts widely differing points of view.	Accepts views somewhat differing from his own.	Discourages differing points of view; intolerant.
CURRENTNESS OF MATERIAL	Keeps course up to date; presents results of current research or scholarship; introduces still-debateable issues.	Occasionally mentions current or recent research in the field.	Course preparation could have been made years ago.
PRESENTATION	Stimulating and exciting.	Moderately interesting.	Puts you to sleep.
AVAILABILITY TO STUDENTS	Is often available and easily approached for formal or informal contact in addition to posted office hours.	Reasonably friendly; can be approached after class and during posted office hours.	Resists student contact, rarely available after class; rarely keeps, or has no regular office hours.
USE OF OWN RESEARCH	Consistently incorporates own research into course.	Occasionally incorporates own research into course.	Little or no evidence of involvement in research.
PREPARATION	Shows definite evidence of careful preparation.	Shows some preparation.	Not well prepared.

TABLE

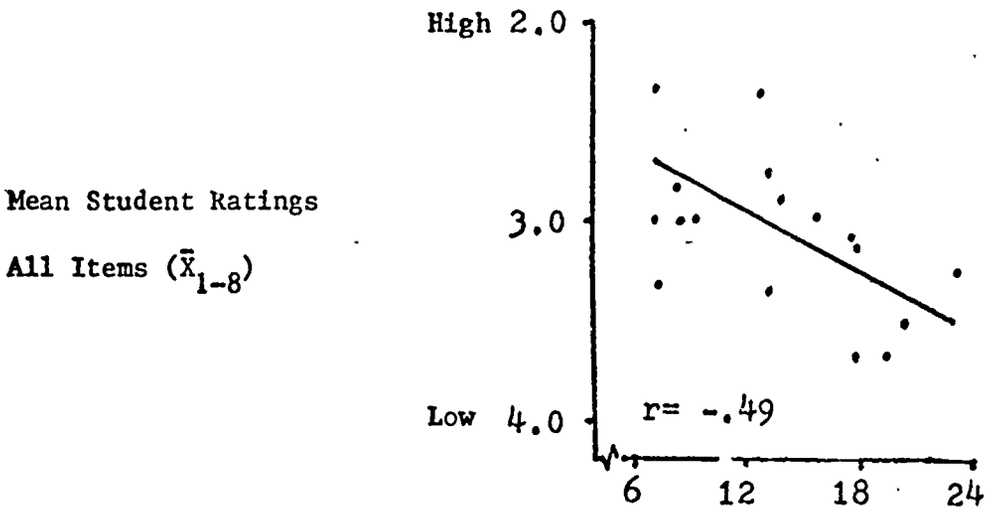
RAW-SCORE, PERCENTILE, AND STUDENT-RATING RANKS
BY DEPARTMENT

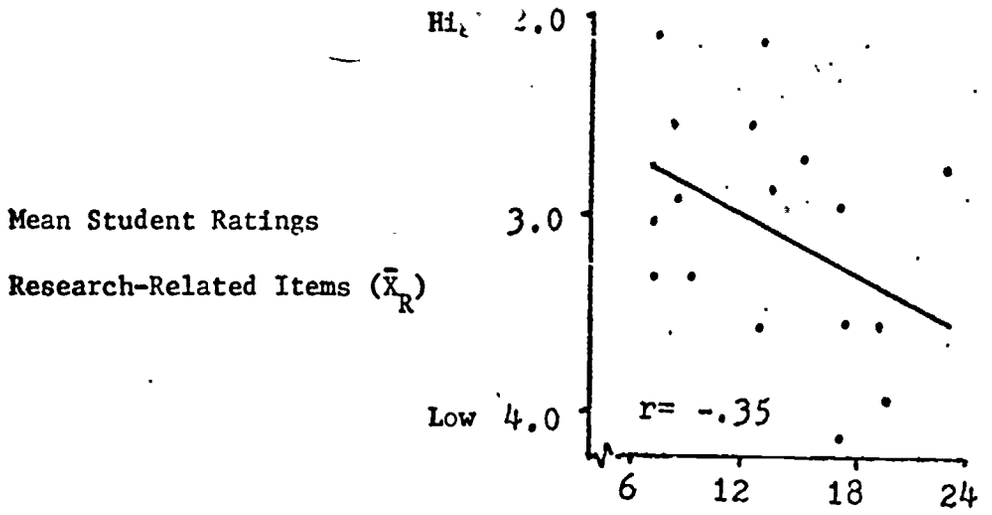
		ACE RAW SCORE RANK		ACE PERCENTILE RANK			STUDENT RATINGS RANK	
	Department	Percentage Who Rated Department Distinguished and Strong	R	X/Ex	%ile	R	$\bar{X}$ 1-8	$\bar{X}$ R
HIGHER	Geography	58	1	6/34	82	2	5	3
	German	49	2	12/48	75	8	8	8
	Mathematics	40	3	18/102	82	2	15	16
	English	39	4	12/92	87	1	7	12
MIDDLE	Sociology	36	5	13/73	82	2	6	7
	Anthropology	29	6	16/42	62	16	3	4
	Physics	25	7	20/113	82	2	11	14
	Chemistry	22	8	24/125	81	6	14	13
	Psychology	17	9	27/110	75	8	10	9
	French	16	10	19/63	71	14	1	1
LOWER	Economics	*	11	19/91	80	7	16	15
	Geology	*	11	22/69	69	15	2	2
	Mechanical Engineering	*	11	20/71	73	10	17	17
	Music	*	11	18/43	59	17	13	10
	Philosophy	*	11	19/65	72	13	4	5
	Political Science	*	11	21/74	73	10	12	6
	Spanish	*	11	18/65	73	10	9	11

*These departments are in a score range placing them below French, but no percentages were given. They are listed alphabetically.

Figure

Relationship Between Percentage of Faculty Time Spent on Departmental Research and Student Ratings





Footnotes

* A special note of appreciation is extended to John G. McMillin who co-authored the final report to U.S.O.E. and who, more than anyone else, contributed to the project's success.