THE IMPACT OF DEPARTMENTAL RESEARCH AND TEACHING CLIMATES ON UNDERGRADUATE GROWTH AND SATISFACTION

ABSTRACT

Are differences in departmental teaching and research climates associated with differences in the academic integration and intellectual growth of the undergraduates who major in those academic disciplines? This study examines various student and departmental measures in 27 academic departments at the University and concludes that departments with balanced orientations toward research and teaching have the most favorable impact on students.

[This research report is a condensed version of a similarly titled journal article by J.F. Volkwein & D.A. Carbone, J. of Higher Ed., 65: (March/April 1994) pp. 147-167].
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THE PROBLEM

A major challenge for research universities is achieving the proper balance between the discovery of knowledge and the transmission of knowledge. Many authors view these faculty research and teaching roles as being in conflict. Some argue that the best faculty are diverted from undergraduate education by the lure of research, grantsmanship, and graduate instruction. Others argue that research can produce intellectual narrowness and over-specialization. At least three national reports have expressed concerns about the weakened priority of undergraduate instruction in universities: "Involvement in Learning," "Integrity in the College Curriculum," and "The Undergraduate Experience in America."

A second belief, held by other authors, is that research and teaching are companions, not competitors. These authors argue that research increases faculty knowledge and intellectual vitality, that teaching fosters a love of knowledge which compels one to conduct research, that the best faculty scholars and best students both tend to be attracted to research universities, that scholarly performance is the best test of one's ability to perform in the classroom, that faculty who are productive in research are more likely to challenge students by their higher expectations, and that research productivity reflects systematic thinking, self-discipline and orderliness which are concomitants of good teaching. Faculty and administrators at research universities generally believe that scholarship and discovery define the special mission of the institution and benefit both students and society as a whole.

A third view is that research productivity and instructional effectiveness are independent and have little relationship to each other. Feldman's 1987 review and synthesis of the literature on research performance and teaching performance reports that the average correlation between student ratings of instruction and various measures of faculty research productivity is 0.12. In other words, these studies report a positive but weak relationship between measures of research and scholarly productivity on the one hand, and measures of teaching effectiveness on the other.

The vast majority of studies rely upon student ratings of instruction as the dependent measure. The published literature contains only a few studies which examine the relationship between faculty research activity and student outcomes other than student ratings. Previous studies of faculty research activity have not focused upon the academic department as a unit of analysis, nor has there been an investigation of the association between an academic department's
research climate and the intellectual growth of its undergraduate majors. Does a strong research orientation by an academic department promote or hinder student learning? Are differences in departmental teaching and research climates associated with differences in the academic integration and intellectual growth of the undergraduates who major in those academic disciplines? The current study addresses these questions by examining departmental and student data collected at Albany.

METHODS and VARIABLES

For this study, we developed four measures of departmental research climate, four measures of teaching climate, and five outcomes variables as dependent measures. We also examined various measures of student academic integration and social integration. The analysis draws upon the outcomes survey responses of a population of graduating seniors in 27 different academic departments at Albany. The outcomes database consists of the combined responses of 655 randomly selected seniors who entered the institution as freshmen between 1978 and 1982 and who graduated between 1982 and 1986. We also conducted interviews with deans and chairs, and gained access to faculty resumes and multi-year university data on instructional contact hours and research grants.

This research adopts a multi-measure approach, using both judgmental and quantitative information. We attempted to avoid the limitations that would be created by a narrow time span and uni-dimensional measures.

Measures of Student Integration

Several earlier studies have established the importance of student academic and social integration as a condition which is strongly associated with student growth. In their studies, Pascarella and Terenzini and their colleagues developed the Classroom Involvement scale, the Faculty Relations scale, and the Faculty Concern scale as measures of academic integration and a Peer Relations scale as an important measure of social integration. The classroom involvement scale is a set of items which ask students to report the extent to which they learned from and were stimulated by their classroom experiences. The Faculty Relations scale is composed of four items which ask students to report on their personal relationships with faculty, as well as faculty's influence on their intellectual, personal and career growth. The Faculty Concern scale asks students to report how interested faculty are in students and teaching. The Peer Relations scale reflects the extent to which students have developed strong friendships and interpersonal
relationships on the campus. In previous studies by Terenzini et al., and by Volkwein et al., these scales achieved alpha reliabilities ranging from .73 to .87.

**Measures of Department Research Climate**

When trichotomized (high-medium-low), these four research climate variables formed a scale with a reliability (ALPHA) of .90, indicating a high degree of congruence among the two judgmental and the two quantitative measures.

1. **Grant Applications**: per faculty member for each academic department over an 8 year period (1978-86).

2. **Grants Received**: per full-time faculty member for each academic department over an 8 year period (1978-86).

3. **Dean's Rating**: The Dean of each college rated (High-Medium-Low) the climate for research and scholarship in each department in that college between 1978 and 1986.

4. **Percent of Active Scholars**: The percent of active scholars in each academic department was determined by a panel of four university people who agreed on discipline-specific standards reflecting scholarly productivity.

**Measures of Department Instructional Climate**

When trichotomized (high-medium-low), these four teaching measures formed a scale with a reliability (ALPHA) of .57, indicating a modest degree of congruence among this mixture of judgmental and quantitative measures.

1. **Dean's Rating**: The Dean of each college rated (High-Medium-Low) the undergraduate teaching climate in each department in that college over the eight year period covered by the study (1978-86).

2. **Student Ratings**: Graduating seniors rated faculty interest in teaching on a scale from one to five. Individual ratings were aggregated to form departmental averages.

3. **Faculty undergraduate instructional contact hours**: Departmental averages for undergraduate level instruction over the eight years were calculated from the university's course and section analysis.

4. **Faculty/student academic contact**: Graduating seniors reported the number of out-of-class faculty contacts of at least ten minutes to discuss academic matters. Individual frequencies were aggregated to form departmental averages.
Student Outcomes Measures

1. **Senior Year Intellectual Growth** - an 8-item scale (Alpha = .86) which asks seniors to indicate their growth during the past year on a 4 point scale.

2. **Four Year Intellectual Growth** - a 12-item scale (Alpha = .95) developed for this study from survey data collected by Terenzini and his associates at Albany. The survey asks seniors to indicate their growth over their entire college careers on a 9 point response scale from no growth to extraordinary growth.

3. **Four Year Growth in Disciplinary Skills** - a three-item scale (Alpha = .88) asking seniors to indicate their growth in understanding their disciplines' research methods, schools of thought, and relatedness to other disciplines on a 9 point response scale from no growth (1) to extraordinary growth (9).

4. **Senior Year Growth in Disciplinary Skills** - The same 3-item scale asking seniors to indicate their growth during the past year.

5. **Academic Satisfaction** - Three items (Alpha = .80) which ask seniors to respond on a Likert-type scale to statements about their intellectual and academic satisfaction.

A Summary of the Results

Based on the organizational literature, we entered the study with the expectation that different academic departments would have variable research and teaching climates, and that these orientations would exhibit stability over time. These expectations are confirmed by the findings. There is enough variability in the measures to conclude that academic departments even within the same institution can have substantially different orientations toward research and teaching. Moreover, in the judgments of the deans and chairs we interviewed, there was little change in departmental research and teaching climates during the 8 years between 1978 and 1986. Faculty turnover and position growth in the 27 departments during this period was low, and undergraduate student selectivity at the university also remained about the same. Similarly, the quantitative research and teaching measures also exhibit stability, with high, medium, and low scoring departments remaining about the same relative to each other, over the eight year period.
Average Intellectual Growth Scores
Reported by Seniors Majoring in
Three Different Types of Departments

Growth Scale Scores

- High Teaching
- High Research
- High Both

Senior Year Growth
- 21.1
- 22
- 24.2

Growth All 4 Years
- 75.2
- 79
- 84.9
Our second important finding is that the research variables are not significantly correlated with the teaching variables, neither individually nor collectively. The correlations among the separate teaching and research measures range from -.22 to 0.17. Eleven of the correlations are negative and fourteen are positive, but none are statistically significant. This strongly suggests that teaching and research climates are relatively independent, and undercuts the rhetoric in the field which views research and teaching emphases to be either negatively or positively associated with each other.

Third, for seven out of the eight academic and outcomes measures, the highest score was obtained by students majoring in departments rated high on both research AND teaching, and the lowest score was obtained by students majoring in departments rated low on research. To investigate the relationships between different mixtures of departmental climate and the experiences of student majors, we used the research and teaching measures to divide the departments into high, medium, and low trichotomies for teaching and for research. Each department was classified as falling into one of five climate categories, high research/high teaching, medium research/medium teaching, high research/low teaching, low research/high teaching, and low/low. We then analyzed the department and student data against eight dependent variables -- three measures of academic integration, and five outcomes.

Student classroom experiences, faculty relations, and faculty contact are greatest in those departments characterized as strongly oriented both toward research and toward teaching. The second highest academic integration score averages are reported by students in departments measured to be moderate in research and moderate in teaching emphasis. Students on the whole report less favorable experiences with faculty, both inside and outside the classroom, in those departments which lack a strong research climate, or lack a strong teaching climate or lack both.

A combination of strong research and strong teaching climate appears to make significant contributions both to the academic integration of undergraduate majors and to their intellectual growth and disciplinary skills. The highest intellectual growth and disciplinary skills scores are reported by students in the high-research/high-teaching departments. This pattern generally holds true both for their growth in the senior year and for the growth they reported for the entire four years at the university. Students in exclusively research oriented departments on the whole report more growth than those in exclusively teaching oriented departments. Academic satisfaction appears about the same under these five different departmental conditions.
DISCUSSION

This is the first study which attempts to measure the research and teaching climates of individual departments, and which examines the relationships between those climates and undergraduate student outcomes. Using both empirical and judgmental measures of department climates, we find substantial variability among the 27 departments in their separate orientations toward research and toward teaching. The research variables, while significantly correlated with each other, are not significantly correlated with the teaching variables, but their correlations with teaching are more often positive than negative. Thus, we find little evidence to support the argument in the literature that research enhances teaching; but we find even less evidence to support the opposite argument that research is harmful to teaching.

These findings suggest that department research and teaching orientations are relatively independent of each other and are consistent with Feldman's meta-analysis of the student ratings literature. Student ratings of individual instructors generally display a positive but low correlation with faculty research and scholarly productivity, and that same low positive relationship is reflected also in the teaching and research climates of the 27 departments in this study.

Our study attempts to look beyond the measures of department climate and to examine the impact on student learning and growth. The seniors who majored in each department self-reported their academic experiences, their growth, and their satisfaction on scales developed by Terenzini and his colleagues. We find that the most favorable classroom experiences, faculty relations, faculty contact, intellectual and disciplinary growth are reported by seniors majoring in departments rated highly both on the research measures and on the teaching measures.

The results of this investigation strongly suggest that a vigorous departmental research orientation by itself is not detrimental to the academic experiences of students. And when a strong research climate is combined with attention to teaching responsibilities, it does have a beneficial influence on the academic integration and intellectual growth of undergraduate majors. As shown in the attached chart, departmental climate does play a statistically significant, though modest, role in student learning and cognitive development.

The classroom scale is the only variable that is strongly associated with all five outcomes measures. The faculty relations, faculty contact, and peer relations measures exhibit strong influences in two or three of the five regressions. Thus, it appears that student learning, development, and satisfaction are primarily influenced by the vitality of the classroom experience, and secondarily by student-faculty relationships outside the classroom and by the
strength of student friendships. This is entirely consistent with a large body of the evidence from the past two decades of research summarized by Pascarella and Terenzini (1991).

These findings reflect only indirectly on the larger issue of whether an undergraduate education at a research university is better or worse than one at a non-research institution of higher education. Public criticism by parents and legislators suggests that the quality of the student experience at a research university is necessarily inferior, as it is characterized by large classes and a lower faculty commitment to teaching. This study did not address that larger question, but these findings at least cast some doubt on the accuracy of the public perception. Generalizing from the academic department to the university as a whole, our results lead us to hypothesize that the most powerful undergraduate learning environments may occur in research universities that also attend to the undergraduate program.

Our findings strongly suggest the value of a balanced department climate -- one in which both teaching and research efforts are valued. We find that the most successful student experiences occur in departments which fulfill both roles -- discovery of knowledge and transmission of knowledge. Further research should investigate the nature of faculty workload sharing in such departments. Are balanced departments characterized by a greater spirit of faculty cooperation and teamwork than the others? How do balanced departments recognize and reward both scholarship and undergraduate instruction? From an administrative policy perspective, we in higher education value student heterogeneity and view student diversity as enhancing the learning experience. Should we not also value faculty heterogeneity and role diversity within departments?

BIBLIOGRAPHY


