

"Scholarship Reconsidered" - Inherent Dangers in its Applications

Michael P. Doyle
Department of Chemistry
Trinity University
San Antonio, TX 78212

Focus first on the CBS program "60 Minutes". The reporter is visiting the University of Arizona. "I have read the catalog listing of professors," she observes, "and I find many distinguished faculty, but I am shocked," she says, "to find that distinguished professors are not generally accessible to undergraduate students." Observes a member of the humanities faculty: the more distinguished you are, the less you teach. The interview and commentary continues with increased criticism of the professorate and its focus on research, inexperienced teaching assistants, and a reward system that emphasizes research at the expense of teaching. This commentary in March of 1995, to which the President of the University of Arizona was refused on-camera reply, reflected the general theme of "Scholarship Reconsidered" by Ernest L. Boyer which described, already in 1990, "the divisive struggle on many campuses between research and teaching".

"Scholarship Reconsidered" reports that "research work often competes with classroom obligations". (Notice here the choice of words.) More than half of faculty surveyed (54.5 percent completion from 306 selected colleges and universities representing, equally, the nine Carnegie Classifications) at research and doctorate institutions agreed that at their institution "the pressure to publish reduces the quality of teaching". The solution offered is complex, dividing the function of what it means to be a scholar into four parts and emphasizing the need for diversity in practice and recognition.

In practice there has been a misalignment of the functions of the professorate at some institutions, but criticism regarding "research versus teaching" has affected all levels of education. Two years ago the president of a distinguished liberal arts college stated to me that he felt that research interfered with teaching at 4-year colleges. He was stating a charge that has received wide acceptance in some undergraduate institutions. "Teaching institutions versus research institutions" is an increasingly common designation, especially by the vast array of predominantly undergraduate institutions whose interests in attracting students are closely tied to their economic well-being.

Let us first establish some facts. "Scholarship Reconsidered" was written for all institutions of higher education, not just "doctoral" or "research" universities. But research can be said to dominate only a fraction of the less than 200 institutions at which a Ph.D. degree in chemistry is offered. Why then is there such an outcry that research dominates teaching? Is it because, as E. Boyer asserts, those that have elevated research are prestigious, and all institutions seek prestige?

A consortium of 50 self-selected liberal arts colleges meeting at Oberlin College issued a report in 1985 in which, attempting to gain recognition in a time of concern about students entering graduate degree

programs, they portrayed themselves as "the research colleges" - those that valued the conduct of research by their faculty. But what was the productivity of these faculty from the "best" institutions? The answer was that the average faculty member in math and science produced 0.5 publications per year! And not all of those counted were research publications. Is there "too much research" being conducted at the "research colleges"?

When the National Science Foundation introduced their Research in Undergraduate Institutions (RUI) program in 1984, there were more than 100 proposals submitted during the first year to the Chemistry Division. This number decreased to an average of about 70 which held until the early 1990's when there was a precipitous drop in the number of proposals to below 30 per year. Does this signify that "too much research" is being conducted at undergraduate institutions?

In the late 1980's the Camille and Henry Dreyfus Foundation introduced a new program, now entitled the "Scholar/Fellow Program", intended to provide chemistry/chemical engineering faculty at predominantly undergraduate colleges and universities (those without a Ph.D. program in these areas) who had distinguished themselves as teacher/scholars with the opportunity to engage a "fellow" who would perform research under the guidance of the mentor and gain teaching experience with the craft expressed by the mentor. In the first year there was an "applicant pool" of more than 50; this year the pool was less than 20. Among the more than 2000 chemistry faculty in the Council on Undergraduate Research's directory of "Research in Chemistry at Undergraduate Institutions", aren't there more than one percent who are appropriate teacher/scholar mentors each year?

Given that the vast majority of faculty are at institutions that do not have Ph.D. programs in the chemical sciences, concern over teaching versus research is misdirected. At these institutions there can be said to be too much teaching and not enough research! As Harry Holmes, a distinguished chemistry faculty from Oberlin College, stated in response to Professor Rennsen of Johns Hopkins University, who asserted that small college faculty should teach and not do research, "research provides a refreshing vitality" that makes the subject alive in students (Volume 1, issues 1 and 4 of the Journal of Chemical Education). Institutions whose faculty are engaged in research attract the best and brightest faculty, stimulate students to careers in the sciences, offer an environment for education that brings students to an understanding of the state-of-the-art. However, every time that public attention is drawn to the conflict between research and teaching, research, as it is performed at predominantly undergraduate institutions loses.

In 1987 there were only 5 high field NMR spectrometers at predominantly undergraduate institutions. In 1995 more than 130 undergraduate institutions had such instrumentation. The National Science Foundation's ILI and RUI programs were mainly responsible for matching costs that allowed the purchase of this "expensive" instrumentation, although some institutions purchased NMR instruments entirely with their own funds. However, some institutions have recently placed caps on spending for capital equipment that will prevent the upgrading of

existing instruments as well as the purchase of new equipment. Although exact data are unavailable to me, I estimate that the gap between undergraduate and graduate institutions narrowed until about 1992 and, more recently, has widened in the ability of these institutions to acquire and utilize state-of-the-art instrumentation. If present trends continue, the gap could be so wide as to prevent a majority of faculty from undergraduate institutions the environment and resources suitable to the conduct of research.

Ernest Boyer observes that "while teaching remains central at the liberal arts college, faculty members may, from time to time, choose to focus on a research project, at least at one point or another in their careers". He goes on to say that funds should be made available for such work, but that faculty at liberal arts colleges should "establish collaborative relationships with colleagues at research universities so that resources might be shared." In my view, this is a totally inadequate representation of the research enterprise and, although I value and utilize collaborations, the word "collaboration" signifies that both parties have something to offer. Consider the condition of an undergraduate institution that openly states that the only research that can be performed is that done in collaboration with colleagues at a "research institution": is this the career that you expected to find after obtaining a Ph.D. degree?

Teaching may be the primary focus of liberal arts colleges, but is the expertise that is formulated in this environment transportable to other institutions and environments? The answer is generally "no"; the teaching "innovation" is specific to a particular individual, department, or institution, and this is expected. Yet, as the title of this computer conference implies, there must be a "scholarship of teaching" that can be recognized and rewarded in the same way that research is recognized and rewarded in Ernest Boyer's view of the professorate.

Is the "scholarship of teaching" a competent delivery of lectures in the classroom? I don't think so; although expected of the faculty, competent delivery of lectures should be equated with someone who has successfully repeated a published procedure in the laboratory. Is the "scholarship of teaching" the development of a new laboratory experiment or a new demonstration? "Maybe" should be the answer, because impact is a factor in judgement; there are many new experiments and demonstrations published each year in the Journal of Chemical Education, but few of them are ever repeated or cited. But even though these activities may not be equated with scholarship in the same way as is the perception of "research scholarship", they are vital engagements.

I have advised colleagues that exemplary teaching is the core responsibility of a faculty member and that innovation, whether in research or in teaching, distinguishes an individual. The problem that we encounter is "what is this distinguishing innovation?" Boyer states that "we now have a more restricted view of scholarship" and "basic research has come to be viewed as the first and most essential form of scholarly activity". He goes on to state "when defined as scholarship, however, teaching both educates and entices future scholars". Is this

the answer? Is teaching scholarship when it educates and entices future scholars? None of Boyer's descriptive comments on "the scholarship of teaching" have convinced me that there is the same distinguishing innovation in classroom teaching as in what can be universally regarded as innovative research.

There are, however, individuals whose activities truly exemplify the "distinguishing innovation" that can be found in teaching. George Pimentel surely is such an example; his Chem Study curriculum and Chemistry Week innovation revolutionized education no less, and probably more, than many or most research discoveries that are of award quality and revolutionized our understanding of nature. Is it of concern that he was highly regarded as a research scientist?

The issue of scholarship must be one of innovation whether in research or education. But many of us also hold that research is education, so innovation in research is also innovation in education. What are the barriers to a broadened view of education that encompasses research? The chemistry community has only one journal for education and one national "education" award associated with the American Chemical Society, and my own experience suggests that the establishment would not wish this to change. Research awards describe discoveries but rarely, if ever, denote the learning process or the persons involved in the advance to discovery; too often we diminish the impact of others so that the importance of our innovation is enhanced. In many respects, we reflect the society in which we live.

We really do need to change, but the change is not only to implement the scholarship of teaching. At most colleges and universities we need to enhance respect for research, to remove the opinion that research diminishes teaching, and raise expectation by faculty that innovation will be supported and rewarded. We also need to arrive at an understanding of what we mean by "innovation" in teaching and to instill this understanding early in the career of a faculty member.

We are entering an uncertain future, but one that is certain to restrict activities in higher education. Do we foster antagonism between research and teaching or do we support both with the core ideal that all faculty should be teacher/scholars? Teacher/scholars, in my view, bring respect to the professorate and should be our ideal.