

FACULTY RESEARCH AND  
UNDERGRADUATE TEACHING

Does it Matter? Personal Reflections of a Teacher

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Critics of Richard Nixon were many. Supplies of gasoline were few. The end of a presidency and of unrestricted petroleum were both near. Nations were polarized, peace evasive. It was 1973 and the best of times and the worst of times when I left graduate school trained as a scientist. I took a position at Old Dominion University where my main responsibility would be teaching. Twenty six years later impeachment has been in the news. Petroleum has never been cheaper. We live in a world of a singular super power but peace is still as elusive as the butterfly of love.

During that time, higher education has also gone through great transformation. These changes are often described in negative terms like “crisis,” “closing of the mind,” “ineffective,” “absentee faculty,” and the like. Some things are the same. I am still teaching undergraduates.

Teaching is my major contribution to the university. At the same time I am an active researcher with the requisite grant support, publications, and research awards. This is important to emphasize because I do not separate research from teaching. The two are points on a continuum of scholarship. If the purpose of a university is the creation and dissemination of knowledge then faculty members are the practitioners effecting it about through their research and teaching.

Remarkably little is known of the relationship between research and teaching. A few studies have explored the activity of scholar-teachers at a select group of undergraduate institutions including such notables as Williams, Swarthmore and my

alma mater, Beloit (McCaughey 1993). McCaughey captures much of my feeling about the importance of scholarly activity in the professoriate. Unlike those in his study, however, I am not at one of the select colleges. My institution, Old Dominion University, is a mid-level state university that evolved from a branch campus of another institution. Admission requirements are less stringent. Expectations are lower. On the other hand, graduate programs at Old Dominion University have expanded tremendously in the past thirty years. Like many similar schools, no faculty member is likely to be hired in a tenure tract slot here who is not an active researcher. Such institutions have received scant attention regarding the impact of faculty research on their undergraduate program. I have pleaded for this elsewhere (Musselman 1994) and still feel like a voice crying in the wilderness.

I want to once more explore the relationships between faculty research and undergraduate teaching beginning with how the practice of research affects the teacher/investigator. After that, I will be foolhardy enough to approach the landscape of institutional views on the professorship. These views are based on many years of teaching, thus more from personal experience than experimentation.

Let's begin our survey of the ecology of this relationship by inquiring what constitutes a good teacher. Each semester I ask students in my sophomore level

general botany course what they consider are the features of a good teacher. First responses are always in the category of caring, helping. We will assume that those relational traits are a given and turn our attention to course structure and classroom behavior. Here students agree that knowledge, enthusiasm, communication, and organization are essential. My hypothesis is that research activity strengthens each of these. One way is through the process of creating knowledge. Parson and Platt (1975) put it this way:

Students are cast in the role of "learners." But so are researchers since it does not make sense to investigate if there is nothing to be learned in the process. The difference lies in the fact that the research investigator cannot rely on a human teacher who already has specific answers. Otherwise there is no research, only plagiarism. The researcher can rely on teachers as masters of the traditions relevant to his own problem-formulations, as masters of methods of investigation, and as models of what an investigator should be. But no previous physicist taught Max Planck the properties and theoretical significance of Planck's Constant since, before Planck's own investigative work, there was no such concept. The investigator is thus learner--even

student . . .

These authors could be accused of outdated Enlightenment optimism but I think they have a good point. Research keeps me a learner because I create knowledge. It is important to emphasize, indeed it is the very point of research, that this information is not available in any other way. You just can't look it up in a book.

How this knowledge is created is not the issue. Library work, field effort, and laboratory experimentation can be involved. I would argue, however, that research is more than just compiling information. Creation of something entirely new is a requisite. The value of the discovery, the manner of synthesis, and ultimate incorporation into the corpus of existing knowledge on that subject is an important, though ancillary, matter. In summary, research creates knowledge and this knowledge is passed on to students.

Research stimulates enthusiasm. The thrill of conducting original research, in learning that the discovery is new is the very thing that motivates scientists. How does this play out in the classroom? As someone with enthusiasm for plants bordering on the extreme, I find it hard to consider how it could not generate a response from my students! Teacher enthusiasm validates a commitment to a

discipline. After all, the things we are most enthusiastic about are the things we usually love the most. Students identify with this enthusiasm.

What about communication and organization? The process of scientific investigation is not complete until those discoveries are communicated. How they are communicated is not as important as the fact that the scientist subject results to a wider community for criticism and refinement. Preparing a report, manuscript, paper for presentation at a scientific meeting, or a web page hopefully requires thoughtful synthesis. This process of winnowing and refining helps establish what is the most salient finding of the effort. Students benefit from exposure to researchers-teachers who have honed their communication skills.

The intellectual activity of the teacher who is solving problems, addressing issues, and reading the literature invariably affects the student for the good. When this is occurring, both the teacher and his or her mentors are students. In summary, research activity creates knowledge, stimulates enthusiasm, promotes communication, and requires organization--features, I would argue, that are also essential for effective teaching especially for those of us in the greying professorate. McCaughey (1993) shows an inverse relationship between the age of the teacher and teachers' effectiveness. The exception is for those faculty members who are

older and still pursuing active scholarship. They epitomize the concept of a lifelong learner so have much to contribute to outreach from the university.

Before turning our attention to aspects of the current situation in higher education, we should briefly consider the historical role of a college and university faculty in research. Prior to World War II, professors were generally expected to be involved in some scholarly activity in addition to teaching. This could have been a long term research effort like the production of a monograph or a series of publications spaced over several years. With the establishment of large government supported research, that all changed. By 1950, considerable money was available for research. The launch of Sputnik on 4 October 1957 resulted in torrents of money flowing from Washington. Universities became research mills. At the end of the channels were faculty members who received the funding.

Now the problem was how to evaluate these faculty researchers. Monographs that might take a decade to produce were no longer valued because instant academic gratification was essential to document to the funding agencies that things were happening. While epochal achievements in science ensued, so did a dreadful fragmentation of research products.

Writing from a post-modernist stance, Lucas (1996) cynically notes:

Typically dressed up in ponderous and nearly incomprehensible argot, overly specialized beyond any legitimate disciplinary need, and consisting for the most part of microscope analyses of narrowly drawn topics far removed from issues of larger public import, faculty publications in the social sciences and humanities in particular, in one critic's words, amount to little more than a 'weak gruel of dead abstractions occasionally seasoned with obscure pomposities.'

Moreover, because large sweeping theories in general are suspect, because academic culture distrusts those who dare to venture outside the bounds of their own accredited fields of expertise, and because popularization of almost any type is frowned upon, prudence dictates that professors become intellectual and scholastic miniaturists of sorts, speaking to and for the exclusive benefit of others like themselves within the academic cloister.

There is much in this withering criticism that is true. But it also reflects a changing paradigm in higher education which resonates with widespread public discontent. Parents of college students are dismayed that their children might not have a better quality of life than they have. When this is the case, resources used for

faculty research are scrutinized. Is faculty research a luxury relegated to only a few schools which can afford it? Are professors more interested in erudite research than in how much undergraduates learn? Lucas (1996) reflects the attitude of many when he writes:

Finally, although the general public may be willing to support the notion of a select few research universities where undergraduate teaching is not a top priority, it appears unlikely that the tendency of other schools to take on the same system of priorities will be allowed to continue indefinitely without challenge. There are simply too many prospective students and their parents who value institutions of higher learning not for their outreach and service functions and still less for their research mission but for the teaching they are capable of supplying. Rightly or wrongly, as prudent consumers, they will expect and demand nothing less than the highest-quality instructional programs possible.

One of the reasons parents think this way is because we in the academy have done such a poor job of showing the link between research and classroom results. It may be too late to adequately show the beneficial relationship between faculty

research and teaching. Like the cutting of the rain forest and resultant extinction of species, we can end up destroying part of the academic landscape without knowing the role it has played in the larger process of student benefit.

A second problem influencing the research activity of the undergraduate teacher is the trend toward very broad research efforts that draw upon diverse disciplines. Interdisciplinary studies are in, narrow specialized studies are frowned on (Rowley et al. 1998). This is good if solid scholarship can be incorporated into the system and if knowledge is created rather than just being rearranged. For the faculty member working at a small liberal arts or religious college, however, opportunities for intensive collaborative research are likely to be limited.

A further potential jeopardy to scholarship in the undergraduate realm is the replacement of science practice with technology, and ultimately the replacement of scientists with machines. Technology is not science; it may be developed and used by scientists but should not be mistaken for science. Many of our graduates are well trained as technicians and poorly trained as scientists. Given the right equipment, they can conduct the tests, produce the data. But it may not be science if critical thinking and creative ideas are lacking.

Nor can students learn science through virtual reality games. Yes, the

computer is now the instrument most used by biologists, replacing even the venerable microscope. However, interacting with a computer is not the same as real laboratory experience. For example, computers are powerful tools for the identification of plants and other organisms. Placing the species in a matrix for search by unique strings will probably replace traditional field manuals for determining plants. Students who use only computers, however, will miss out on subtle differences of plants under field conditions. Variation among plants in a population that includes both open grown and shaded plants is not readily detected using only a computer. In almost three decades of teaching plant identification, I find the most efficient way for students to learn plant is to observe them in the field.

Can some scholars examine the relationship between research and undergraduate teaching at a diverse guild of universities? Can science be included in these studies? (McCaughey's study was limited to social sciences)? In short, although we lack substantial data to make meaningful evaluations of the benefit to teaching, research activities of undergraduate teachers are not being encouraged. Obviously, neglecting students for time on research and public service is not acceptable. Nor does it often occur. Time should be allowed for faculty research. In the end, students are the benefactors because it gives them mentors who are

professionals in their fields.

James Shapiro, in a recent essay in the Chronicle of Higher Education (12 February 1999), bemoans the tendency in literature classes to use only short books. According to him classes " . . . reflect and perpetuate the values that our society holds most dear: expediency, brevity, uniformity."

Science, like literature or any other scholarly activity, is demanding. It is counter cultural to expediency, brevity, and uniformity. Difficult and contorted problems, vast amounts of time, and diversity characterize the practice of science. Faculty must mentor students by modeling science. This is called research.

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