Research as a model for university teaching

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Abstract. Forty-nine active researchers in 28 university departments were interviewed about their research and teaching. Though most disciplines were clustered within specific research types, lectures were almost universally prescribed for teaching large and undergraduate classes. Except for seminars, commonly chosen for graduate classes in the humanities, teaching methods did not reflect how professors pursued their own learning. A second study replicated the first with 22 English and 18 chemistry professors. Nearly all the chemistry staff did experimental research, and nearly all the English did analytical. Lectures dominated teaching prescriptions of the former, and lectures and seminars the latter; had teaching and research been closely related, there should have been much less overlap and dispersion in the teaching prescriptions. Finally, only a few instructors in either study traced their research directly to experiences involving teaching. Although general methods by which teacher-researchers pursue knowledge do not appear to be reflected in undergraduate teaching, and research does not widely benefit directly from teaching, the strong belief that the two interact may suggest they should, perhaps in more subtle ways, and the implementation of this interaction is not inconceivable.

Is the methodological character of one's research reflected in university teaching? Are the processes by which the scholars learn reflected in the overall methods by which they propose to teach their students? Are any such relations dependent on disciplinary differences, the level of the students being taught, or individual variations among professors within a discipline? Is research propelled by one's teaching?

The requirement in the modern university to do research, preferably good research, is historically rooted in 19th century Prussian universities, the time and resources being made available by the elimination of compulsory classical studies (Gillett, 1966, p. 37), and a reduction in the weight given to teaching ability in the selection of professors (McClelland, 1980, p. 183). The editor of the Times Higher Education Supplement recently stated that "while not all university teachers or even departments needed to be actively engaged in research, a faculty, and still more a university, had to have a strong research mission. ... students need to be taught by people who were active players, not passive spectators in their disciplines" (Scott, 1988, p. 3). One wonders about the fate of those who are not such active players.

It is widely believed that research and teaching mutually enhance each other: "resonance between teaching and research is 'the significant characteristic of a leading university where knowledge is both created and disseminated by the same people' (Pierre, 1985, p. 11)". When the same issue rose to the level of
a public debate, the Principal of the university at which this study was conducted wrote,

At McGill teaching and research must go hand-in-hand. Each informs the other. They are equal – and equally high – in priority.

McGill is proud of its contributions to the advancement of learning through research but we strongly believe that the excitement of discovery must be a cardinal theme in undergraduate classes. These first degree students ... should share in a sense of adventure that comes from speculating about new discoveries to be made and new territories and seas to be mapped and charted.

Finally, for the professor, good undergraduate teaching informs and propels good research. It helps to shape the fundamental questions and principles in a discipline and the capacity to relate new insights to the existing base of knowledge (Johnston, 1986).

Do students partake of such speculation and adventures? Do professors so benefit from their teaching? Is it true that “scholars are de facto good teachers” (reported by Brian, 1986, p. 1)? Bornheimer, Burns & Dumke (1973) declared it was

absurd to believe that merely because a scholar thoroughly comprehends his discipline he can communicate it expertly to his students. It is equally absurd to believe that merely because a pedagogue thoroughly comprehends the methods and techniques of teaching he can present a discipline ... adequately to his students (p. 29).

Webster’s (1984) view of the interplay between research and teaching is more extreme:

We find it more fun, more exciting, more rewarding, and less constraining. ... we argue that we should do research not for the real reasons but for one that is more acceptable to the students, parents, and legislators who indirectly pay our salaries—the possibly spurious reason that our research will enhance our teaching.

Is this hypothesis correct? I don’t know. But at least the old saw that research and teaching mutually support each other ought not to be accepted as true, but rather should be considered a hypothesis subject to verification (p. 4).

By teaching we are referring in this study to classroom teaching, not to thesis supervision, laboratory project courses or the like. We also focus on the process of planning a setting in which learning will occur, not on the specific content, nor on the skills or characteristics of the teacher. Regarding content, it has been shown by Donald (1987) that key concepts and also their organization differ between university instructors and students, and the process of convergence (a burden mostly on the students) is not rapid. This suggests that how the professor acquires and organizes expert knowledge about a discipline is not immediately replicated in students’ understanding or representation of the subject matter. One must not only teach the content, but be explicit about the conceptual context and how new knowledge complements existing knowledge in a discipline. Common (1987) noted that several important overviews