TEACHING FOR BETTER LEARNING IN A RESEARCH UNIVERSITY[1]

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Introduction: Dispelling some myths about teaching-research links

It is something of a cliché to say that teaching and research are inextricably linked. Involvement in research is the distinguishing characteristic of the contemporary university, and the term "research-intensive" is claimed as a badge of honour by so many institutions that the term has lost much of its meaning. Yet Western universities have not always placed such stress on research, in the sense of faculty engaging in empirical scholarship – what Ernest Boyer, 1990, called the "scholarship of discovery". In the early days of Canadian universities, scholarship was understood more broadly as engaging with the discipline through wide reading in the field and discussions with colleagues about intellectual and academic issues. I would like to try to unpack some of the mythology surrounding current understandings of the relationship between teaching and research, especially as it relates to undergraduate education.

First, is it true that good teaching and good research go hand in hand, in the sense that faculty with distinguished research accomplishments (e.g. grants and publications) are generally good teachers? There is in fact a considerable amount of empirical research on this topic, and while the measures employed are often not ideal, on the whole it appears that there is at best only a modest correlation between teaching effectiveness and success at research.[2] This to me implies that (a) if you want to be a good teacher you have to work at it, just as you do to become a successful researcher, and (b) if we wish to foster proficiency (or even excellence) in *both* teaching and research we have to deliberately plan for that to happen. Later I will try to make some suggestions about what form such a plan might take.

A second assumption about teaching and research is that undergraduates would benefit from knowing more about faculty research and becoming involved in research themselves. While this seems at first blush to be an attractive proposition in a research university, I would suggest that the benefits depend in part on the nature of the research involved and the goals or learning outcomes envisaged. Do we mean empirical research using methods and problems characteristic of the discipline concerned (e.g. undertaking an honours thesis, or joining a research team in science)? Do we mean tackling an empirical problem commonly faced by professionals in applied areas, such as business, engineering, or medicine? Or is the research approach of a more generic nature, such as problem-based or inquiry learning?

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[2] For a good review, see the 1994 report of the Task Force on Resource Allocation prepared for the Ontario Council on University Affairs: *Undergraduate teaching, research and consulting/community service: What are the functional interactions? A literature survey.*

While many faculty are enthusiastic about inculcating undergraduates into the values and methods of their discipline and are keen to prepare students for future postgraduate study, and even an academic career in the field, it is important to remember that a substantial majority of undergraduates never go on to postgraduate work, and relatively few outside the professions work in the discipline of their major. In involving undergraduates in research there is an assumption that, say, designing and carrying out an empirical study in the discipline will develop skills that transfer to other life and work situations. Ironically, however, the empirical evidence for such transfer is mostly lacking (see Perkins & Salomon, 1994). Of course, no-one would deny the need for students to acquire general problem-solving skills and the ability to think deeply and critically about problems and issues, and in the last part of this paper I discuss how this might best be achieved. First, however, I wish to examine how good teaching takes place in research-intensive universities, including some institutions that have attempted a closer integration between faculty members' research interests and their teaching approaches.

Leading teaching in research-intensive universities: the Oxford study

Starting in 2005, Graham Gibbs, Sergio Piccinin and I have been conducting a research project at the University of Oxford Learning Institute on leadership of teaching in 11 research-intensive universities in Europe, North America, and Australia, including such prestigious institutions as MIT, Stanford, the University of Edinburgh, and the University of Sydney[3]. Each participating university nominated two academic departments that had a demonstrated record of excellent teaching, using criteria that included results of student evaluations and graduate exit polls, data from departmental reviews or quality audits, number of faculty members with teaching awards, and whatever other indicators might be available – which varied according to the institution and national system concerned.

We visited the 22 departments in 2005 and 2006, and prepared a series of case studies based upon extensive review of relevant documentation, and interviews with the department head and other key faculty members, with students, and in some cases with other stakeholders. The cases embraced a wide range of disciplines and professional programs. In each case our focus was not just upon teaching and learning in the department, but on the drivers of good teaching – which people were involved, and what were the strategies they used to encourage an emphasis on quality teaching. This is what was meant by the term "leadership of teaching".

We are currently in the process of interpreting the cases, but I am able to share the following preliminary conclusions.

- **Teaching approaches.** Teaching in research universities is often quite traditional and (paradoxically) unsupported by research evidence of good practice – in part because major time constraints imposed by faculty research

[3] The official title of the project is *Departmental leadership for quality teaching: An international comparative study of effective practice*, and it was funded by the Leadership Foundation for Higher Education (UK) and the (British) Higher Education Academy.

commitments seems to discourage innovation and change in teaching approaches. However, there are some outstanding counter-examples of innovative and effective teaching and curricula, in some cases involving successful attempts to involve students in research.

- **Teaching and change.** Good teaching almost always seems to involve change in teaching methods, in organisation of curricula, and in learning outcomes.

- **Crisis-driven change.** Change is often the result of a crisis or opportunity, in many cases driven by external pressures.

- **Professional programs.** Innovative teaching and changes in teaching are more common in professional programs where there are close links to practitioners, and hence greater concerns with transfer of learning from university to the workplace.

- **Leadership of teaching.** Good teaching and changed practice does not happen accidentally, but requires leadership. Leadership of teaching may not always come from the nominal head of the unit, though support from the head is usually crucial.

- **Distributed leadership.** In most examples of successful innovation, leadership is distributed among several – sometimes all – members of a department.

- **Models of leadership.** There is no single model for leading good teaching practice: leadership can be manifested and distributed in many different ways, both formal and informal, though effective leaders of teaching do have some characteristics in common.

- **Consultation.** Most examples of changed practice involve extensive consultation with multiple stakeholders, including faculty and non-academic staff, students, and employers.

- **Vision, communication, and decision-making.** Effective change in teaching and curricula requires articulation and acceptance of a clear vision for learning (often in the form of agreed, broadly stated, learning outcomes), shared goals, open and frequent communication with all stakeholders, but not necessarily complete unanimity in decision-making.

- **Recognition and rewards.** For teaching to change, and good practice to take hold, there must be a climate of recognition and celebration of teaching efforts and successes, both within the department and usually beyond.

- **Sustainability and resources.** To bring about and sustain changed practice there must be adequate support, including provision of time and resources (space, money), and leaders often play a major role in obtaining such support.

- **Evidence-based teaching.** The outstanding examples of change to good teaching practice were all evidence-driven. This implies teaching approaches consistent with the research literature on effective practice as well as ongoing efforts to gather data about teaching effectiveness and learning outcomes.

- **Recidivism.** Even when changed practice has been shown to be effective, there is a slippery slope of recidivism to the traditional in teaching. Sustaining innovation and good teaching practice requires careful advance planning and constant vigilance.

Applying research to teaching

Of particular importance here is the notion that effective teaching – meaning *teaching for effective learning* – has to be based on sound empirical evidence about the sort of teaching methods and approaches that produce particular learning outcomes. Unfortunately, one consequence of the fact that few faculty members receive any explicit training in teaching is that we approach the task in a rather amateur fashion – in both the good and bad sense of that term. Indeed most faculty and university administrators are unaware that there is a considerable body of research on effective teaching practice, much of it specific to the special context of higher education. The most interesting and influential line of research over the past 25 years has focussed on the factors that promote cognitive development in students – not simply acquisition of information that is generally measured by traditional examinations and tests, but more generic skills, such as problem-solving, critical thinking, and what the researchers have termed "deep" learning. We now know a good deal about what promotes effective learning in undergraduates, and furthermore this substantial body of research offers many pointers to the way we might best organise teaching to promote deeper and more independent learning.

The emphasis here is not so much on *how much* students learn, but on *change in learning processes*, and how these are affected by instructional interventions (teaching) and departmental (or institutional) learning climate. Investigators have identified different learning approaches, measured changes in learning approaches over time, and tried to discover the determinants of such change. This research derives from a number of individuals working in different countries – but relying greatly on a cross-fertilization of findings and methods of inquiry. The work is associated with the names of scholars such as Marton and Säljö in Sweden, Entwistle and Ramsden in England, and Biggs, Kember, Trigwell, and Watkins in Australia and Hong Kong.

These researchers have identified and described different learning approaches, beginning with the classic papers by Marton and Säljö (1976a, 1976b), who first used the terms "deep" and "surface" approaches to learning, later renamed by Entwistle and Ramsden (1983) "meaning orientation" and "reproducing orientation". Deep learning refers to an approach that emphasises the pursuit of meaning and understanding for its own sake, and deep learners appear to be largely intrinsically motivated. The act of

learning is its own reward, and the major goal of such learners is to integrate new learning and ideas with their existing understanding. Surface learners on the other hand are primarily motivated to meet minimum task requirements (e.g. to pass the course), and they see learning as mainly a matter of reproducing information without any particular interest in its meaning.

Of course all of us frequently engage in surface learning just to get through the many tasks we face in our everyday lives, and surface learning may indeed be appropriate for many routine matters. But to meet the challenges of change and complexity in modern society, university students inevitably need to use learning approaches that stress depth – in the sense of conceptual understanding and integration of new knowledge with existing ideas, to solve complex and often novel or unanticipated problems.

What sorts of learning approaches are used by university students, and how are they affected by characteristics of the department or institution, especially by teaching methods? An early study at the Australian National University by Watkins and Hattie (1981) reached some pessimistic conclusions. It involved an ambitious longitudinal investigation of 540 students as they proceeded through their undergraduate programs, with approaches to study measured by both questionnaire and personal interviews. The research revealed that students' learning orientations in fact became progressively more surface over the three years of their university studies, and Watkins and Hattie attributed their results primarily to the examination system which, they concluded, discouraged adoption of deeper learning approaches.

More optimistic conclusions can be drawn from an investigation by Ramsden and Entwistle (1981), who studied over 2,000 British university students enrolled in 66 different academic departments in the humanities, social sciences, sciences, and engineering. There was no universal pattern of change in learning orientation over time, but some departments, across all the disciplines studied, did foster adoption of deeper learning approaches by their students. Such departments were characterised by "good teaching", "greater freedom in learning", and "avoidance of overloading". Good teachers were defined by Ramsden and Entwistle as instructors who tried to understand student difficulties, were ready to give help and advice on study methods, and took care to pitch material at an appropriate level. The authors defined "freedom in learning" as allowing students a choice of tasks to complete course requirements, and a choice of learning methods to accomplish these tasks. Other characteristics that appeared to promote deeper learning included setting clear goals and standards for academic work, vocational relevance (perceived links between what was being studied and students' later lives and careers), social climate (good relations between students and teachers), and less emphasis on formal teaching (attending classes) compared to a stress on the importance of individual study.

Several years later, Bertrand and Knapper (1991) did a partial (and much more modest) replication of the Entwistle and Ramsden study in three academic departments at the University of Waterloo, using questionnaires adapted from the 1981 research. Student learning approaches in the three departments were found to differ markedly in the

predicted directions, and persisted over time. They were also associated with aspects of teaching and academic climate identified by Ramsden and Entwistle (Knapper, 1995).

Kember has also shown links between the orientation of individual teachers and a change in their students towards deeper learning approaches. Kember developed a scale to measure teaching values and beliefs, and distinguished, following Barr and Tagg (1995), between "subject-orientation" at one end of a continuum, and "student- or learning-orientation" at the other. Teachers holding more learning-centred orientations, and who encourage more active learning and interaction with students, appear to promote deeper learning than teachers who hold more subject-centred values (Kember & Gow, 1994).

Although the work cited above has been done mainly with student populations in Europe, Australia, and Asia, the findings about links between teaching methods and learning outcomes receive some support from American research that has adopted quite different methodologies. For example, Astin (1993) in a massive project that involved 20,000 students, 25,000 academic staff, and 200 institutions in the USA, showed that the characteristics and behaviour of teaching staff had major implications for student development. In particular, opportunities for student-faculty interaction had "positive correlations with every self-reported area of intellectual and personal growth" (p. 383), and there were similar positive effects associated with opportunities for interactions among students themselves. In contrast, sheer number of hours devoted to teaching was unrelated to cognitive development, suggesting it is the *quality* of teacher-student contact, not the quantity, that is of critical importance.

Pascarella and Terenzini (1991) analyzed the results of over 2,600 empirical studies dealing with the impact of higher education on student learning and development. They concluded that student learning is "unambiguously linked to effective teaching, and we know much about what effective teachers do and how they behave in the classroom" (p. 619). Such behaviours include the instructor's ability to establish rapport with students, interpersonal accessibility, feedback to students, active learning strategies, opportunities for students to interact with their peers, and "a curricular experience in which students are required to integrate learning from separate courses around a central theme" (p. 619). Writing about the implications of their research for policy and practice, Pascarella and Terenzini conclude that academic departments should strive to "create environments that attract and engage students in both intellectual and interpersonal learning" (p. 653).

This research is largely unknown to North American academics outside of educational development centres. Nonetheless the concept of deep learning is intuitively appealing to most teachers as a sensible goal for undergraduate education. At the same time, many of instructional practices and curriculum planning processes work against achieving a move to deeper learning. Elsewhere (Knapper, 2004) I have attempted to provide a simple overview of research relevant to teaching and learning in higher education and attempted to derive a set of guidelines for good practice.

Developing a scholarship of teaching

The idea that there is a respectable body of research that could inform good instructional practice has resulted in calls for university teaching to be more professional and evidence-based. University teaching is one of the very few professions where practitioners receive almost no formal preparation for their work, where there is no process for the accreditation of minimum competence, and where involvement in continuing professional education is uncommon – although the growth of educational development centres has begun to change this to some extent, and in many parts of the world (for example Australasia and Europe) the professionalisation of university teaching is well underway. Boyer and Rice (Boyer, 1990) use the term "scholarship of teaching" to describe the process of undertaking research on instructional practice and using teaching methods that reflect the insights from such scholarship. Over the past 15 years many academics have embraced the notion of teaching scholarship as a means of encouraging a more systematic approach to university teaching. But there is a danger that that the term will be used simply as a slogan, and that the any scholarship of teaching will always be second-best to the "scholarship of discovery" or empirical, discipline-base research.

If we are to base a scholarship of teaching on established scholarly traditions then this would have some of the following implications.

- Teaching should be **informed** and **evidence-based**.
- Teaching activities and achievements should be **documented**.
- Teaching approaches should in general be **replicable** by others, in the sense that someone should be able to understand enough of a teacher's approach to try it for themselves.
- Teaching should have some **conceptual underpinnings**, in the sense that there should be a reason why we do what we do as teachers.
- Teaching should involve some **assessment of process and outcomes** so that we can tell whether our teaching approaches are effective, in particular in promoting particular types of learning.
- Teaching should involve some sort of **reflection** that might lead to change and improvement.
- Teaching should build on such reflection to effect **change** (hence the idea that scholarly teaching is dynamic and even creative).

Interestingly, these characteristics were present in almost all the successful examples of good practice we observed in the Oxford case studies.

At one level, making teaching more scholarly might simply mean becoming informed about teaching in higher education through reading, discussion with colleagues, attending workshops, etc. (what many lowlier professions do as a matter of course). But we also have to gather evidence about our teaching, for example from students and alumni (through questionnaires, classroom assessment techniques), by measuring learning outcomes, identifying the products of good teaching (e.g. exemplary student projects), through action research, and sometimes with controlled experiments.

How research might produce better learning: What needs to change

I have spent most of this paper of examining one aspect of the teaching-research interface – the issue of how empirical research on teaching should inform and change educational practice. I have argued that, despite the difficulties of undertaking scholarship in this area (because of problems of controlling all the relevant variables in a complex environment), there is now an impressive and convincing body of research that shows how the way we organise teaching affects student learning processes and outcomes. We know that how students are taught, what learning tasks and experiences they encounter, and how instruction and curricula are organised have a profound effect on generic learning approaches. But has this had in fact produced any real changes in educational practice?

In my view there is little doubt that teaching has changed considerably since I began my academic career in the early 1960s, and started work as a full-time educational developer in 1976. That is to the good, since the teaching methods of 45 years ago would be inadequate to deal with the students and educational pressures of the early 21st century. The range of teaching and learning methods now in use is much broader, there is much greater awareness of ethical and diversity issues in dealing with students, and teaching is regularly documented and evaluated at both the individual and institutional level. Perhaps more important, there is more conversation and reflection about teaching, more concern about teaching practices and effects on learning, in part due to the establishment of educational development centres, which have acted as catalysts for discussion and innovation.

At the same time, there is a great deal about university teaching that remains problematic, and which stubbornly resists the precepts about good practice that developers have been preaching for several decades. Specifically:

- Teaching remains overwhelmingly didactic and reliant on traditional lectures; assessment methods are often trivial and inauthentic (Lammers & Murphy, 2002);

- Curriculum development relies far too much on disciplinary tradition and faculty interests, rather than student and societal needs;

- There is still a “tyranny of the academic disciplines” which mitigates against integration of knowledge and insights from different fields;

- Evaluation of teaching effectiveness and learning outcomes is often superficial.

Moreover, there are factors that suggest things may get worse before they get better. For example, in 2006, classes are generally much larger and teaching is more depersonalised than it was 20 or even 10 years ago. And because students spend an increasing amount of their disposable time in formal classes compared to the past, listening instead of processing and reflecting, there is often little time or incentive for them to engage in the independent learning that the modern world demands and most faculty members support. There is enhanced use of educational technology, especially for distance education, but all too often this emulates traditional didactic teaching and testing instead of promoting student curiosity and autonomy. In other words, there is too often a poor alignment, to use a term coined by John Biggs (1999), between what is taught and the competencies students will need in their later lives and work settings.

A major challenge for universities, especially at a time of resource constraints, is to organise teaching so as to maximise learning effectiveness. As I have argued earlier, a major barrier to change is the fact that most faculty members are not trained for their teaching role and are largely ignorant of the research literature on effective pedagogy. The need for change is urgent, and a number of commentators have offered suggestions on how this might be done (e.g. Biggs, 1999; Kember, 1997; Prosser & Trigwell, 1999; Weimer, 2002). Ideas include:

- Teaching methods that stress student activity and task performance rather than just acquisition of facts;

- Opportunities for meaningful personal interaction between students and teachers;

- Opportunities for collaborative team learning;

- More authentic methods of assessment that stress task performance in naturalistic situations, preferably including elements of peer and self-assessment;

- Making learning processes more explicit, and encouraging students to reflect on the way they learn;

- Learning tasks that encourage integration of information and skills from different fields;

- Curriculum planning that focuses on realistic student learning outcomes rather than disciplinary traditions and faculty preferences.

For example, both problem-based and inquiry methods encourage active learning, meaningful interaction with a teacher, team learning, reflection, authentic assessment, and integration of knowledge from different fields. And even traditional research tasks, such as the undergraduate thesis have the great advantage of encouraging students to

take ownership of their own learning, with the teacher as facilitator and guide as well as subject-matter expert. The research universities that have undertaken such initiatives can take credit for encouraging teaching based on evidence of good practice – even if in some cases they perhaps did so inadvertently!

Despite some achievements in making teaching more scholarly and more effective, clearly there is much more to do if teaching is to be practised in a way that is as professional and systematic as our approach to research. This certainly involves efforts by individual teachers, but it also requires structural changes that can only be brought about by academic leaders – including hiring practices reward structures that recognise the importance of teaching expertise, quality assurance approaches that measure learning processes and outcomes in a much more sophisticated way than has been customary, support for research in university teaching and learning (traditionally not encouraged by the research councils), and changes in the way we accredit universities and prepare new entrants to the profession.

Finally I think there is an important role for senior administrators in higher education to become more involved with the university teaching function, to familiarise themselves with what is known about effective practice in teaching, learning, and curriculum planning, and to speak to the community at large about universities not just as educators, not just as managers, fund-raisers, or institutional boosters, but as educators. Higher education in Canada has changed profoundly over the past 50 years of my own involvement. While some of these changes have been for the better, I am not sure that the student experience of higher education has improved as much as many of us would like. For me, student learning, now as then, lies at the heart of the higher education enterprise, and any attempts to link research and teaching more closely should have effective and meaningful learning as the major goal.

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