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Keywords

Research-led learning, Research and teaching

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Abstract

Integrating research and teaching in research-intensive universities is an unresolved issue as we head into the 21st century. While studies conclude that the early years of the undergraduate curriculum should be more intellectually exciting, few universities have implemented approaches such as research-led learning. The conceptual shift that is necessary involves harmonisation of the collegial and developmental cultures. Of the forces that support convergence, focusing on the curriculum and learning design may offer the best potential for connecting students and academics to knowledge communities and linking the research, teaching and scholarship missions. An important element in transforming the research-intensive university is recognising the importance of flexible and equitable reward systems 'in order to promote an overall balance in the relative importance of research and undergraduate education' (Gray, Froh, & Diamond, 1992, p.15).

Introduction

Several years ago Lewis Elton (2001, p. 45), at the time professor of higher education at University College London, suggested that possibly "the oldest relevant statement" concerning research and teaching was Wilhelm von Humboldt's vision in 1810 of the future of the new University of Berlin. In his memorandum "On the Spirit and Organizational Framework of Intellectual Institutions in Berlin (1809/1810;1970)," Humboldt, a German statesman, philologist and architect of the University, observed that the purpose of a university for both the teacher and the student is "a common quest for knowledge" or *Wissenschaft*. Elton further noted in his paper that Humboldt had in "a master stroke" "abolished the problematic nature of the research-teaching link".

The tension between the two central academic missions appeared to be even less relevant or obvious for John Henry Cardinal Newman, who throughout the 19th century exerted a strong spiritual influence on both the Church of England and later the Catholic Church. On becoming rector of the newly-established Catholic University of Ireland, he discussed, through a series of essays and lectures, *The Idea of a University* (1852, 1858) in which he saw the university as "a place of teaching universal knowledge" and as a source for "the diffusion and extension of knowledge rather than the advancement," questioning that "If its object were scientific and philosophical discovery...why a University should have students."

Regrettably for some, in the intervening years, neither Humboldt's optimism for a shared university purpose nor Newman's thoughtful reflections on the mission of a university have proven to be longstanding as the German and UK universities became increasingly research-oriented during the 19th and 20th centuries along with those in other Western societies.

Clear ways of how best to bring the two together within a scholarship paradigm are still unresolved as we head into this century, which continues to be the case for most universities “seemingly confused about their mission” (Gasper, 1998, p. 3), including, arguably, most Russell Group¹ member universities in the UK. At Oxford, for example, concerned about encroaching “managerialism,” Tapper and Palfreyman (2005, p. 12), in considering the future of Oxford within the context of British higher education, propose “three options as systems models.” From the expanding literature, conferences and the reality on the ground, it does appear that most research-intensive universities across the globe still have not fully realised the harmonisation of the research-teaching relationship. Indeed, as Gerhard Gasper (1998), former president of Stanford University observes, “...the link between the two realms, in many universities around the world, has not been attained” (p. 8). His own view of what constitutes a “research-intensive university” is one that meets three fundamental criteria: “it selects its students; it is primarily dedicated to the search for knowledge; and it is marked by a spirit of critical inquiry” (p. 2). He avoids use of the term ‘research university’ as he does “not think of the university as a research institute, but as an institution where the intensity of research is part and parcel of the traditional university functions of teaching and learning.”

Gasper’s vision of a research-intensive university has been progressed by John Hennessy who became Stanford’s tenth president in 2000 and who in his retrospective report, *Looking Backward, Thinking Forward: Reflections on 2000-2005 and the Future* (2005) notes that

The constants throughout Stanford’s 114-year history have been the dedication to the fundamental research and teaching mission and its commitment to produce graduates who are prepared to be future leaders. (p. 2)

Hennessy refers to the US Commission on Undergraduate Education landmark report issued 11 years ago which made “sweeping recommendations designed to stimulate broader and deeper intellectual engagement by undergraduates.” There appear to be two major consequences at Stanford arising from this report: During the first two years “students are offered more than 200 small group seminars every year” and there has been “a significant increase in undergraduate involvement in research and independent learning.” “Going forward,” observes Hennessy, means continuing to find “new ways to involve undergraduates in the pursuit of knowledge, to develop their skills as independent scholars, and to support them as they take advantage of opportunities that only a research university can offer” (p. 4).

Against this background, in this paper I, therefore, aim to review the current situation as it relates to the interplay between research and teaching, reflect on approaches that may strengthen the relationship and offer thoughts on how educational reform might be enacted in research-intensive universities.

Valuing of Research and Teaching

In the UK there are both symbolic and substantive developments taking place that are trying to move teaching up institutional agendas. One specific example may be the decision that 2008 Research Assessment Exercise (RAE)² panels will accept disciplinary pedagogical and pedagogical research submissions. While there are many sceptics, these developments may in the long run have an impact on providing greater equity between the two in terms of parity of esteem and resources. In the immediate, however, the debate continues. And, while Lee Shulman, president of the US Carnegie Foundation for the Advancement of Teaching asserts that academics are members of at least two “professions”, where there seems to be “significant promise” for “reconnecting the

scholarship of discovery and of integration with the pursuit of scholarly teaching” (2004, p. 201; see also Boyer, 1990), the reality seems to be that in most research-intensive institutions research is still favoured over teaching. Evidence over the past few decades suggests that in the UK (Saintonge, 1997) and abroad (Pratt, 1997) research is considered to be more of a “professional” endeavour, requiring lengthy preparation, while many judge teaching to be more of a “craft” activity” (Piper, 1994) with a heavy reliance on “technique” as opposed to, as one example, thinking more deeply or reflectively on educational processes, human dimensions or disciplinary relationships (Lueddeke, 2003). In a study comparing alignment between individual perceptions of the worth of teaching with those of peers and the institution, Wright (2005) concludes that unique to the research university academics’ views are incongruent (p. 333). Citing numerous papers, she further comments that this misalignment can be the cause of job-related stress, role dissatisfaction and limiting teaching (p. 332).

There is some evidence that there are advantages of learning in a research-rich (RAE)² environment, but [these] are only realised if the link between the research and teaching in the department is deliberately created” (Southampton Institute & HEFCE, 2000, p. 6). This aspect could possibly be facilitated through the introduction of a “graduate standard” which might include a requirement for research skills/awareness, and which focuses on the introduction of research in the design of the curricula, and sees the students themselves taking a key role in creating the research/learning link” (p. 14).

Role of Disciplinary Variation in Conceptualising Research and Teaching

Considering disciplinary differences, we might best view the relationship between research and teaching along a continuum. At one end are, what Biglan (1973) and others, basing their observations on the pioneering work of Thomas Kuhn (1996) and his notions of paradigm development, call the “hard-applied” subjects, such as engineering or “hard-pure,” for example, chemistry or mathematics. These disciplines with highly developed structures or paradigms tend to rely on empirical evidence, facts, principles and problem solving and use rationalist models of inquiry and frequently manifest differentiation into numerous sub-fields. Judging by the literature there does not appear to be an obvious flow from research to teaching especially in the early undergraduate years (e.g., JM Consulting and Associates, 2000, p. 21). This separation can be partly explained by the fact that “increasing specialisation of knowledge makes much research content remote from what students need to know...” (Brew, 1999, p. 291).

At the other end of the spectrum are the subjects or fields with less developed paradigms or “soft-applied subjects” (e.g., business, education) where there are possibly more opportunities for integrating research with teaching in the early years. These disciplines stress critical perspectives, value student interaction and oral/written communication. Some disciplines, (e.g., the social sciences, psychology) seem to lie somewhere in between these two poles and often draw on knowledge and methods of analysis from a variety of disciplines. Del Favero (2005) cites Braxton and Hargens (1996) who in their review of the literature in this field describe disciplinary effects influencing not only disciplinary epistemologies but also role performance, chairperson functioning, organisational structures, salaries and curriculum. In another recent study North (2005, p. 452) concludes that discipline differences play a part in student writing performance, where “students from an “arts” background were found to achieve significantly higher grades than those from a science” background. North’s findings lead to her observation that science students tend to “make more use of unqualified assertions” and that “differences in the students” discursive practices may derive from the different views of knowledge in soft and hard disciplines...” While their approaches to writing may help their “further studies within that discipline, [they] conversely, may disadvantage them in an

unfamiliar disciplinary context.”

Elton, however, ‘fundamentally’ disagrees with this conclusion, noting that “The best students in the hard sciences learn to be critical, self-reflecting, and so forth, without having been taught how to.” His aim is to “make all students critical and self-reflecting, but this requires a different style of teaching.” “At present,” he asserts, “teaching is at the sophistication level of the teachers (and the best students translate it to meet their needs.” Elton wants teaching to be “at the sophistication level of the students” (Elton, personal communication, January 7, 2006).

Professional or applied “life” subjects seem to sit outside the latter continuum as they have only recently, historically-speaking, needed to consider discipline research as part of their agenda (e.g., nursing, occupational therapy). Discipline research at RAE² levels in these areas is practised by only a few in the UK and is located to a large extent with postgraduate teaching. According to Gobbi (2004, p. 117), challenges that nursing faces “are often rooted in tensions between artistic, scientific and magical/mythical practice,” and, therefore, practice frequently needs to draw on a multiplicity of perspectives and paradigms, some of which may compete and overlap. As one example, ‘...the nurse, as scientist, seeks to analyse and possibly change practice through investigation, whereas the nurse as bricoleur (‘someone who uses bits and pieces from several domains’) would alter the events and adjust the tools to create practice” (p. 121).

Enhancing Undergraduate Education by Linking Research, Teaching and Scholarship

From this brief analysis it may appear self-evident that “The way knowledge is conceived is central to the kind of teaching that is done and to what we understand research to be” (Brew, 1999, p. 291), and that a “one-size-fits-all” approach to linking research and teaching in a “symbiotic relationship” would seem to be unrealistic or unworkable. Indeed, at the University of Sydney, Brew (2001), in a phenomenographic study involving 57 researchers, identified “four qualitatively different ways in which research is understood” (p. 271) and evolved a framework which may be beneficial to “explore the conceptions of research of other groups, for example, early career researchers, postgraduate students and their supervisors” (p. 272). From a growing body of literature and conference activity (including a national summit in Canada!), it is apparent that the UK is of course not alone in trying to gain a better understanding of and addressing the challenges involved.

An important milestone in US higher education signifying that more needed to be done to enrich undergraduate education was the establishment in 2000 of a national organisation - the Reinvention Centre at State University of New York, “to work for the improvement of undergraduate education at research universities” (Katkin, 2005). The Centre was set up largely in response to The Boyer Commission Report, *Reinventing Undergraduate Education: A Blueprint for America’s Research Universities* (1998), which highlights that “The first year of a university experience needs to provide new stimulation for intellectual growth and a firm grounding in inquiry-based learning and communication of information and ideas.” A follow-up survey (Boyer Commission, 2003) involving 123 universities, including many top world ranked universities, concluded *inter alia* that most of the universities are helping staff to develop techniques for inquiry-based learning, but few had actually put these approaches into practice, and, echoing UK observations, there might be a need for establishing university requirements for undergraduate research and creative activities.

A case for more concerted action was outlined several years ago in a report to the UK Higher Education Funding Council (HEFC) (JM Consulting and Associates, 2000). Based on

the authors' investigation, Figure 1 "summarises the closeness of links between research and teaching with "the pluses (showing) the strength and directness of the relationship. From the figure it is apparent that most direct relationships occur at the postgraduate level and in subjects like chemistry and engineering, whereas the research-teaching relationship is not very strong across all subject areas in the undergraduate first years.

FIGURE 1: Observed Direct Relationship between Research and Teaching (after JM Consulting and Associates, 2000, p.21)

Students	Chemistry	Engineering	History	Business Studies
Postgraduate Research	++++/++++	++++/++++	+++	++
Postgraduate Taught	+++	+++	++++/++++	++
Undergraduate Year 3	++++	+++	++++/++++	++
Undergraduate Y2	+	+	+	+
Undergraduate Y1	+	+	+	+

Key:
 +++++ teachers/supervisors "teaching their own research"
 +++ teachers/supervisors research active in relevant field
 ++ base of relevant research in the department
 + general culture of research and enquiry informs teaching

The key issue, as Foskett points out, and that the American researcher Burton Clark (1997, p. 246) also acknowledged a few years earlier, may not be "about the connection between "research and teaching but about the connection between 'research and learning.' Research probably needs to be thought of more in terms of processes...and merely as one form of learning, at one end of a spectrum that stretches from information transfer ('lecturing?') to enquiry by individuals or teams. Integrating research and learning therefore is about inculcating the skills of enquiry and research into students. In an information rich world this is much more important educationally than providing students with content knowledge" (N. Foskett, personal communication, December 16, 2005).

International Developments in Research and Teaching

In the UK, Jenkins and Healey published *Institutional Strategies to Link Teaching and Research* (2005), which summarises international and national attempts by institutions "to constitute the relationship better within their policies and practices" (p. 3). Their main contention is that all universities "need to set out to consciously create a meaningful relationship within their institutions" (Higher Education Academy [Resources], 2005). The

authors cite the President of the University of British Columbia speaking at a policy retreat with University Governors:

The re-emphasis of undergraduate education is probably the most pressing issue that universities must face in the next decade. The challenge is to demonstrate that the learning and research environments, at the undergraduate level are not competitive but complementary. (Piper, 2001, p. 2)

Other Canadian universities, most notably McMaster University and the University of Alberta, both ranked in the top 150 world class universities (Institute of Higher Education, 2006) have also made strategic decisions to develop research-led learning at the undergraduate level. The University of Alberta established a working group to examine the linkage between teaching and research for undergraduate students in 2003. Findings from their study included the need to conceptualise the integration of teaching and research; develop linkages in the learning environment and facilitate the integration of teaching and research through professional development, adequate resources, administrative structure, celebration and evaluation. The group made a number of recommendations to the University, including that “All Faculties should have a research, internship/practicum experience for undergraduate students” and the implementation of “a mandatory first year seminar class to introduce students to research and research skills” (Hoddinot, 2005). A few years earlier McMaster University (2005), which has a long history in the use of problem-based learning in medicine and engineering, began an initiative to develop Inquiry across all programs, starting initially with year one and two courses. These

Inquiry courses are skill-driven rather than content-driven, focusing on the skills required to perform effectively at university and well beyond university (and) help students hone skills equally useful for advanced levels of academic research. Teaching is done in teams of generally-active, tenure stream staff, with a three year rotation, reflecting commitment to teach such courses, but also better ensuring that the skills of inquiry teaching are disseminated across the University. (McMaster, Inquiry Page, 2005)

Research and Teaching: A Symbiotic Relationship?

Applying social exchange theory, one consideration might be to recognise that both the research and education communities have a lot to gain from each other. Those who are primarily researchers who do some teaching might take into account Laurillard’s observation that “Teachers need to know more than just their subject. They need to know the ways it can become understood, the ways it can be misunderstood, what counts as understanding; they need to know how individuals experience the subject” (1994, p. 6). And those who are primarily teachers who do some research, disciplinary or pedagogic, might benefit from learning more about the wide array of disciplinary contexts, values and beliefs, diversity of thinking processes and research methods that can help to inform their own understanding and practice. Brew (1999, p. 297) infers that researchers and teachers actually have much in common in terms of their academic work: researchers are essentially involved in “meaning-making activity” or “making sense of chaos and translating this into culturally accepted explanations.” Meaning-making or “constructivism” is very much the way learning is increasingly being viewed in higher education, that is, as a process of helping students to construct knowledge rather than simply transmitting it. The emerging pedagogical goals and emphases, therefore, are “not objective knowledge” that sits outside the learner “but the subjective processes of the learner” and acknowledgement that “learning always takes place in a particular context.” Moving away from traditional empiricist to more pluralistic views of knowledge,

Brew concludes “that research and teaching can be viewed as being in a symbiotic relationship” (1999, p. 296).

Finding Common Ground

While there are many differences between the disciplines, greatest convergence seems to occur when we consider the goals of student learning in higher education. From meta-analyses, all disciplines are keen on enhancing the students’ ability to reason and problem-solve, although there is also general agreement across disciplines for students to learn “to identify the context and state assumptions and change perspective and their learning the selection, representation, and synthesis processes” (Donald, 2002, p. 283; Pillay & Elliott, 2001, p. 7). In addition, there appears to be consensus on the key characteristics that graduates should possess. To cite one example, Hoddinot (2005) references the University of Sydney’s graduate attributes highlighting “research and inquiry; information literacy; personal and intellectual autonomy; ethical, social and professional understanding and communication.” Knight (2001, p. 370) refers to two UK studies –one employer based, the other from recruiter perspectives – both resonate well with the Sydney profile stressing –along with knowledge and self-management skills, communication skills, teamworking and interpersonal skills.

Knight quite rightly posits that “Ambiguous though goals like these are, it is possible to be clear about some of the conditions under which they are more likely to be realized” (p. 370). In the UK there still seems a fair distance to travel for most graduates judging by a recent report involving Britain’s top companies: shortcomings cited include experience of teamwork, communicating in the workplace, self-reliance and work experience (Blair, 2006, p.1). Development of these capacities can be optimised through the use of active learning methods, which appear to be superior to more passive approaches particularly if these are rooted in authentic contexts, and where students are exposed to the ‘thinking’ and cultures of a particular field (Donald, p. 294). Ideally, it would seem that we need, as Ottewill advises, “to look for similarities as well as differences between disciplines. Techniques and approaches, such as group projects, interactive lectures, problem based learning and information literacy initiatives, can beneficially cross disciplinary boundaries with relative ease” (R. Ottewill, personal communication, December 16, 2005).

Rather than keeping research and teaching separate, Barnett (1997) and others advocate that more undergraduate teaching should parallel research. Relating the learning of the methods used to carry out research in their discipline (e.g., using inductive versus deductive approaches) to inquiry-based or research-led learning in particular courses could have benefits for both students and academics. Students would become involved in the processes and language of inquiry at a much earlier stage than now, and staff could support student engagement applying the skills and knowledge that makes them distinctive in their fields. In some cases this dynamic could even lead from the classroom to the department’s research agenda. To cite one case study, applying Brew’s classification (2003) of research-led teaching to their curriculum and learning design, Holbrook and Devonshire (2005) describe how they successfully implemented an online ocean (climate) model simulation activity in physical geography and physics. The authors maintain that “By simulating scientific thinking through the online activity, students are encouraged to think like a research scientist” (p. 9).

The journey toward increasing research-led learning in the early stages of the undergraduate curriculum could be made more attractive or easier by adapting practices that seem to work at other research-intensive universities. Jenkins (u.d.) provides a case example at University College London where students in a highly-rated department are asked to interview members of staff about their research. Tutors give tutorial groups their

CV and three pieces of the work before the interview, and students then write a report on the aims of the staff member's research, how their research relates to their earlier studies and to their teaching. Jenkins identifies several benefits of this approach: perhaps the most important of which is that the researcher-teacher linkage has to be built into the curriculum and does not just happen by chance. Another facilitative action by most research active institutions to promote the research-teaching link might be "to ensure that learning and teaching strategy references the research strategy and even more crucially, vice versa" (R. Ottewill, personal communication, December 16, 2005).

John Dewey's Influence on Research and Education

Much of the current thinking on research- or inquiry-based learning can be traced back to the work of John Dewey, probably the most influential American educator of the early 20th century. Following the ideas of earlier American 'pragmatists,' Dewey 'held that genuine thought begins with a problematic situation' and, at a broader level, he believed that 'philosophy should concern itself with human problems in a changing and uncertain world. In attempting to distinguish these, and keeping in mind the sociocultural and historical moment in which Dewey wrote, he cleverly compares the "difference between the 'logical' and the 'psychological' to the difference between the notes which an explorer makes in a new country to the finished map that is constructed after the country has been thoroughly explored" :

The map is not a substitute for personal experience. The map does not take the place of an actual journey. The logically formulated material of a science or branch of learning, of a study, is no substitute for the having of individual experiences. But the map, a summary, an arranged and orderly view of previous experiences, serves as a guide to future experience...Through the map every new traveler may get for his new journey the benefits of the results of others' explorations without the waste of energy and loss of time involved in their wanderings-wanderings which he himself would be obliged to repeat were it not for just the assistance of the objective and generalized record of their performance...For the scientist, the subject matter represents simply a given body of truth to be employed in locating new problems, instituting new researches, and carrying them through to a verified outcome... The problem of the teacher is a different one ...He is concerned with the subject-matter of the science as representing a given stage and phase of the development of experience... (Dewey, 1915, p. 20)

For Dewey, then, the logical and the psychological are "mutually dependent," as there needs to be an organic connection between the subject-matter and the learner and it is the teacher's responsibility to transform the material into life-terms, "to psychologize it" (p. 23). It is somewhat remarkable how accurately Dewey's visionary perspectives on learning resonate with contemporary learning theory. To illustrate, Ginn (2002), in summarising recent neuroscientific research on similarities among learners' (p. 17), notes that "...when the brain is asked to solve a problem, decipher a code, fathom a mystery, unravel a puzzle, respond to a curiosity, answer a creative request, it immediately bursts into life" (p. 22).

While, as Benjamin (2000) observes, European higher education has generally been more interested in student learning, the concern in N. America in the last century has been largely on curriculum (referring to content, teaching and learning strategies, assessment and evaluation processes and what teachers do). This focus would help to explain Barnett's et al. comment a few years ago that in the UK curriculum "receives scant regard in current debates about teaching and learning in higher education" (Barnett, 2001, p. 435). It may also provide a rationale for the ready adoption of rational curriculum

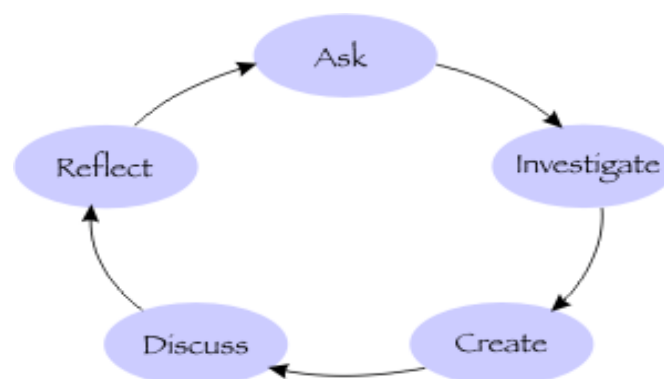
planning models throughout UK higher education. Without widespread experience of and a national debate on alternative curriculum conceptualizations (e.g., outcomes vs. process or competency vs. values curricula) in research universities, it was, arguably, relatively easy for the UK Quality Assurance Agency (QAA)³ to advocate standard curriculum measures.

Optimizing Rational Curriculum Planning in the UK

These procedures have now been cast in the form of program specifications, which in turn are underpinned by subject benchmarks and codes of practice. The specifications generally follow a linear blueprint consisting of learning outcomes, learning activities, assessment and evaluation and contain other information (e.g., entry level requirements, credit ratings) to support readers' understanding of the program. While not without its critics (see, for example Knight, 2001), this 'systems' and competency-based approach to curriculum-building can conceivably provide a meaningful framework for developing research-led learning units if tutors adopt a creative planning approach within a rather tightly coupled curriculum mould (Lueddeke, 2007a). As one example, perhaps in collaboration with employers and drawing on current and future-oriented literature in a particular profession or field, the curriculum development process could begin by identifying key issues, themes, or problems that typify an occupation. These could then become the building blocks of the curriculum. This type of "front-end" research or analysis, as it is sometimes called, might then lead to consideration of the entire learning environment and processes (i.e., how best to meet the learning outcomes; see also Pillay & Elliott, pp. 14-15) along with defining staff support and institutional policy, resource and logistical arrangements.

Applying dimensions of current learning theory, teachers could adopt a research-led learning paradigm (Figure 2) in which students work collaboratively and study concepts, principles, issues or problems in some depth (versus surface learning). In addition, as Knight advises, the undergraduate program could be "structured ...so that students get progressively less help and guidance from teachers as they encounter more complex situations..." along with time "for strategic thinking, reflection, planning and portfolio-making..." (p. 375).

FIGURE 2: An Inquiry Cycle (McMaster University, 2005)



The Question of Change and Educational Reform

The literature on change management is extensive (see, for example, Birnbaum, 1988; Kotter, 1996; Smith, 2002). Unfortunately, however, with the possible exception of problem-based learning, primarily in the healthcare field, there are relatively few examples of fundamental and long-lasting educational reforms involving research-intensive universities. The lecture still reigns supreme and 'learning- [versus teaching-] led' seminars may still be the exception rather than the rule. Derek Bok (2006), former president of Harvard University and unquestionably the leading university in international league tables, observes that lecturing is still the traditional teaching mode and that little is known about how much students are really learning. Minimising the impact of external drivers such as performance indicators and educational audits, Bok advocates examining the approaches that institutions actually use to foster 'quality and innovation' (p. 14). From the literature most educational innovation seems to occur in institutions that are primarily teaching-focused rather than research-led. This comment is borne out somewhat by the findings of the Boyer Commission three year follow-up study report (Boyer Commission, 2002). There are several reasons that could help to explain the present situation; perhaps most noteworthy is the predominant position that research takes over teaching in terms of reputational benefits, both at institutional and individual levels, and resourcing generally. This prioritisation can have negative effects on the educational front. In the UK, for example, the Research Assessment Exercise¹, has, according to some, diverted attention from meeting student learning needs (JM Consulting & Associates, 2000, p. 13) to raising staff research performance from national to international standards. Resonating with Bok's (2006) view that institutions need 'to discover new and better ways of educating' students, Elton (personal communication, 2006, January 20, 2006) distinguishes between the need for universities to move from the position of simply 'doing things better' (essentially conservative) to 'doing better things' (essentially innovative). "The former," he contends, "remains in the largely unthinking traditional and non-reflective teaching paradigm of universities and won't get us far.

The latter argues that radical changes are needed, if there is to be a solution to the research-teaching nexus," such as

- a shift from teacher-centred to student-centred learning;
- the integration of generic and discipline specific issues;
- the use of radically different teaching and learning strategies such as enquiry-based learning; and
- the realisation that we are all concerned with all (or at least, say 80%) succeeding and not just 'the best' which, although paradoxical, has been the traditional stance of university teachers.

Elton's suggestions, which echo some of the conclusions outlined in this paper, assume a different cultural orientation than the ones that seem to exist in most research active universities. Bergquist (1992), as one example, identified a typology consisting of four main cultures: collegial, managerial, developmental, and negotiating. And, while universities exhibit all cultures in varying degrees, research-led universities likely tend toward the collegial culture, which "encourages diversity of perspective and relative autonomy of work" (p. 17), and where "One is an effective teacher because one knows his or her subject matter and, usually, because one has sat at the feet of another great teacher" (p. 26).

To meet the increasing expectations of students and demands of others stakeholders, who see the university as “the intellectual or nerve centre of a learning society in which the university is a source of intellectual leadership, control, or energy...fulfilling both epistemological and economic roles” (Donald, 1997, p. 11), I remain convinced that a shift toward the ‘development’ culture needs to occur in research-intensive institutions before any serious educational reforms can be enacted. It is in this culture where ‘Faculty are asked to examine their own assumptions about teaching and learning, student needs, and so forth’ (p. 93), and where significant questions may be pondered about the reciprocity between academic missions. Indeed, more than the collegial orientation, this culture may also carry benefits for university research aspirations, including entrepreneurial ventures, thereby maximizing fundamental missions of 21st research-intensive universities. In trying to bridge the gap between these cultures and encourage an acceptable and, questionably, necessary degree of planned change in ‘collegial’ universities, several years ago, I proposed an ‘organic’ (versus ‘mechanistic’) change framework called the Adaptive-Generative Development model (the AGDM) (Lueddeke, 1999, p. 249). The framework is based on constructivist principles in view of the reality that complex change processes “are principally nonlinear and reiterative” as “new insights are created during the actual change process” (p. 247). The AGDM agrees fundamentally with Schein’s view (1985, p. 306) that culture can be changed only when “implicit and silent assumptions” are “brought to the surface and confronted” (as cited in Lueddeke, 1999, p. 250).

In an effort to strengthen research-teaching-scholarship relationships, and inferred earlier in this paper, one ‘window of opportunity’ or a starting point that might be open for both teachers and researchers, might be the conceptualisation or review of a priority curriculum unit selected from the early undergraduate years. Unit curriculum and learning design developments, which could involve both research informed content as well as research-led learning, might lead to new ‘ways of doing things,’ as Elton suggests, or go further still to “doing things no one else is doing” (Smith, 2002, p. 151) or even ‘doing things that can’t be done- what’s impossible today-but...?’ (Smith, p. 201).

Towards More Flexible Career Progression and Rewards Systems

On the surface at least, the idea of giving equal status and recognition to both teaching and research in research-led institutions may belong to Smith’s ‘imaginative thinking’ or ‘impossible to change’ category. However, there are positive signs on the horizon. As one example, several years ago Syracuse University in the US led a national study, involving 47 (33, public; 14, private) research universities, primarily “to enhance the perceived importance of undergraduate education.”(Gray, Froh & Diamond, 1992, p. 2). Funded through a Lilly Endowment grant, the project sought to: (1) find out how senior staff (deans, chairs) “influence the attitudes and priorities of faculty regarding teaching”; (2) help identify “activities and resources that might be used to influence attitudes and priorities”; and (3) find out how “central administrators could support deans and chairs in these efforts”(p. 2). The main themes that came out of this study related to the “campus reward system,” “the relationship between research and teaching,” and the need to evaluate research and teaching “in a more realistic and fair manner” (pp. 13-14). A surprising finding was that while most academics and administrators “believe that an appropriate balance does not now exist at their institutions...such a balance should exist” (p. 15). An overall conclusion was that

...the intrinsic and extrinsic reward systems of the university should be flexible...and recognise a wide variety and constantly changing set of interests and

needs in order to promote an overall balance in the relative importance of research and undergraduate education. (p. 15)

This balance could take place over time in an academic's career. For example, during a consultation on evidence-based practice carried out at this University (Lueddeke, 2007b; 2007c), several alternative career patterns were explored with participants and included considerations of (1) more managed career progression (e.g., "focus on research in early career stages with reduced emphases in later phases"), (2) an expectation, as is the case in a high achieving research-led School, that "all academics need to engage in research and teaching"; (3) suggestion that "there could be room for both disciplinary research and disciplinary pedagogical research with complementary or distinctive career paths"; and (4) the idea that "established, and perhaps "plateaued," academics might contribute differently and productively to a department (e.g., progressing e-learning), taking advantage of in-depth subject and pedagogical knowledge."

Several world-class universities appear to have moved on with this type of thinking. To illustrate, in a Green Paper University of Toronto's Vice-President and Provost (2003, p. 13) points out that leading research universities, such as the University of Pennsylvania, have introduced such positions as "professors of practice...in its Law, Business, Education, Fine Arts and Engineering Faculties..." These posts "are reserved for outstanding teachers who are also distinguished professionals in their fields."

Conclusion

Bjørn Stensaker (2005) from the University of Oslo points out a weakness of the higher education literature in the sense that authors often have 'the tendency to embrace rather deterministic perspectives' (p. 12). He offers the notions of the 'Ivory Tower' and 'marketisation' as examples. There is the risk that the arguments for greater convergence with regard to research, teaching, and scholarship generally, usually espoused along epistemological, philosophical, pedagogical and technological lines, may also be perceived as being deterministic. However, judging from available evidence (for example, university strategies, conference papers, and the like), there can be little doubt that the Western university is caught up in a period where changes in the external environment are making significant, often disruptive, inroads into the internal, and it appears that in the longer term Humboldt's perception of the central function of a university as "a common quest for knowledge" might prove to be right after all. The main differences between 1810 and today, however, may be that the university at the undergraduate level is moving, as Jackson (2004) observes, from 'philology to performativity' and from information dispensing to knowledge construction, thereby potentially enhancing the capacity of undergraduate students to work directly with knowledge-creating communities' (Brown & Duguid, 2000).

In these aspirational learning contexts, where bridges are built linking research and teaching activity, students could learn to discover the world by doing 'real' research, underpinned by collaboration and scholarship, much earlier than at present. Their university journey might begin to add to the global body of knowledge at a most propitious time - when their lives are filled with socialization, enthusiasm, idealism and creativity. Their engagement could transform the undergraduate experience from one that not only emphasises the way the world works to one that also encourages students to think deeply or scholarly about how it might work better. In turn, academics, adopting a scholarship of teaching and learning stance (SoTL), could benefit by increasingly recognising that "systematic reflection" of what they are doing educationally and sharing lessons learned, underpinned by actual evidence, 'can be both deeply personal and highly collegial' and "perhaps the best way to improve teaching for student understanding"

(Georgia Southern University, 2007). Moving toward a more integrated model of higher education, and one that values the scholarship of teaching and learning, would provide a solid basis for giving students new and exciting opportunities for enhancing levels of satisfaction, success and learning.

Notes

¹The Russell Group is an association of 19 major research-intensive universities of the United Kingdom. Formed in 1994 at a meeting convened in the Hotel Russell, London, the Group is composed of the Vice-Chancellors/Principals. There are also a number of active sub-groups. In 2003/4, Russell Group Universities accounted for over 60% (£1.7 billion) of UK Universities' research grant and contract income, approximately 55% of all doctorates awarded in the United Kingdom, and over 30% of all students studying in the UK from outside the EU. The aims and objectives of the Russell Group are to promote the interests of Universities in which teaching and learning are undertaken within a culture of research excellence, and to identify and disseminate new thinking and ideas about the organisation and management of such institutions.

²The Research Assessment Exercise (RAE) is conducted nationally to assess the quality of research in universities and colleges in the UK. Results determine how higher education funding bodies distribute public funds for research selectively on the basis of quality. The most recent RAEs were carried out in 1996 and 2001, and the next is scheduled for 2008.

³ The Quality Assurance Agency (QAA) monitors the standard of teaching in Higher Education in the UK.

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