

Editorial

Research-teaching Links and the Knowledge Problem

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The 2007/08 UK Research Assessment Exercise is now closed for further submissions. Universities have spent several years amassing data and tortuously crafting accounts of their research activity since the last RAE in 2001. Everyone is exhausted and some are turning their minds to strategy for 2008 and beyond. It is a good moment to re-publish and extend a commentary on the research-teaching link first delivered at a conference at Wadham College, Oxford in 2003 (Webster, C.J., 2003, CEBE Newsupdate 8, pp 18-20 and Webster, C.J., 2003, Building the Link Conference on Integrating Teaching with Research and Practice in the Built Environment, Oxford, 8-10 September 2003: URL http://www.cebe.heacademy.ac.uk/learning/research_teaching/pdf/ChrisWebsterLINK.pdf).

The peer evaluations of RAE submissions will help determine status, placement in the rankings and that part of core government funding that is tied to research performance. For this reason they are taken deadly seriously. The good thing about the RAE is that it forces deep reflection and concerted action about departmental mission and strategy. The internal dynamics it sets up have undoubtedly had a major influence on increasing the levels of scholarship, knowledge generation and dissemination among UK academics over the last two decades. The bad thing is that it is all carried out quite independently of an evaluation of the impact on, and links to, teaching and the student experience. In reality, of course, teaching and research are very much interrelated. This is true in the sense that universities would not be universities without both; and good scholarship is probably best founded on the discipline of both activities. But it is true at a more practical level too: with a fixed time budget, individuals face a trade off between the two activities. This is very much in the minds of many academics in the UK at the moment, particularly those not included in an RAE submission; Heads of School trying to optimise the deployment of staff; and VCs trying to optimise university and school budgets.

There are many things that could be said of the research-teaching link in the built environment, including the need to understand the way the link works in vocational subjects that emphasise practical problem solving; in subjects dominated by normative issues such as beauty and justice; and the implications of an eclectic disciplinary knowledge base. In my view, architecture and planning are inherently problematic in each of these regards: normative questions of design, environmental and social justice are not easily mapped into empirical research. Research in the construction and real estate field, on the other hand, is

arguably more naturally empirical by virtue of the greater agreement on underlying values and on the meaning of efficiency in the economic and building systems subject to investigation.

These issues are all secondary in importance to the more immediate problems created by the drive for excellence in both teaching and research under conditions of finite resources. This is a fundamental problem that seems to be almost totally ignored in well-meant discussions on the teaching-learning-research link. The problem is the impact of cumulative, non-linear knowledge growth in both research and teaching domains. My argument is that while a harmonious balance of teaching and research might be desirable – for political, management, pedagogic and other reasons, it is becoming increasingly impossible to sustain. The strains show at individual, school and institutional level. Personally, I think researchers should teach seriously and teachers should research seriously. I am inclined to be a little suspicious of ‘experts’ specialising solely in either activity. The Centre for Education in the Built Environment exists to promote and disseminate good teaching and learning practices but its subject specialists are all working academics with their own teaching and research portfolios. One brings a discipline to the other.

That said, it is also my belief that it is becoming increasingly difficult, if not impossible, to be excellent at both. Like it or not, many of us are forced into making trade-offs – or we have trade-offs made for us by university managers. The situation is exacerbated by the research assessment exercise and by the professionalisation of teaching agenda, both of which raise the time costs of achieving and demonstrating excellence. But the problem comes from a more fundamental secular trend. The problem is that there is too much to know. Attempting to do everything well is not a sustainable option, however ideal it might seem.

A 2003 email survey of UK academics yielded some valuable insights in this respect. 140 colleagues responded: 59% from built environment disciplines and 41% from other fields, principally the physical sciences. In this editorial I select a few facts and figures to pursue the knowledge saturation theme in a highly speculative manner: the aim is to provoke discussion.

Academics are not a homogenous group and policies to promote all-rounder teaching and research excellence will inevitably impact on individuals very differently. Individuals differ in their motivations (the outcomes they are personally trying to achieve) and in the institutional and other constraints that limit those achievements. Motivations and constraints interact over time. Undergraduate contact hours among our survey respondents ranged from 0 to 960 per year; and postgraduate hours from 0 to 650. Total research income during a respondent’s career ranged from 0 to 6 million pounds; publications from 0 to 480; and PhD students supervised from 0 to 55.

Mean responses to questions about teaching or researching less or more were uniformly in favour of teaching less and researching more. There are differences hidden by the means however. Three groups emerge; 66% of the respondents perceive the research-teaching link as operating both ways. They are motivated to teach and to research and both activities complement the other. For 9% of respondents, subject interest drives reflective practice in

teaching but teaching does not drive their subject scholarship. They are possibly scholars/ researchers first and teachers second. There are 4% of respondents for whom the teaching-research link does not work in the way captured in the questionnaire statements: they may be reflective teachers but this does not arise from their subject interest. They may be active researchers but this does not arise from their teaching interest. Notwithstanding this minority group, a balanced view of the teaching-research link seems to prevail. This is endorsed by the “quotable insights into the link”, which respondents were invited to make:

"My teaching interest and quality is directly dependent upon an active involvement in research. For my specialism and my students, this means involvement in practical research projects with clear policy application"

"teaching without research offers students only the status quo; research without teaching is a missed opportunity in the academic community"

"My best and most inspirational teachers were those most actively engaged in research"

"Removing the research link with teaching at universities would transform them into schools that are more difficult. How dull is that? Being an inspiring teacher is much more important than being a qualified one. We need mixtures of the two, but an institution where the research-teaching link has been removed will die."

However, respondents were keenly aware of the difficulties of doing well at both teaching and research:

"In practice the pressures to produce RAE research and to find time to be a good teacher are at odds with each other"

"few people I know do both well, but those that do are also the best in their fields at both"

"At my university, research is becoming less important for most faculty as our budget is largely determined by the number of students we enrol"

"Research led teaching means that academic staff are never available for the undergraduate student"

"I would have liked to do more research in my academic career but I don't know that it would have made me a better teacher."

There is evidence from these and other quotations that trade-offs are made; that specialisation happens – by choice or constraint; and that it is perceived to be difficult to do both teaching and research excellently.

All of this suggests (but in no way proves or quantifies) that teaching enhances research and research enhances teaching, but that there are trade-offs within a finite time budget. The trade-offs are a function of, among other things, the quantity of knowledge available and human cognitive capacity. Figure 1 shows productivity of research and teaching on the vertical axis and percentage of time spent on research and teaching on the horizontal axis.

Moving from left to right, the time spent on research changes from 0 to 100% and moving from right to left the time spent on teaching moves from 0% to 100%. From 0 to 100% in either direction causes productivity to rise, assuming the more you do of a sophisticated activity, the better you become at doing it (economies of scale plus learning). The shape of the productivity curve reflects the learning process – easier tasks, for example, may yield productivity gains with less practice. Both curves peak and fall before they reach 100%, however, because teaching and research are complementary.

Point A is the minimum % of time spent on research needed to maximise teaching productivity; B is the minimum amount of teaching necessary to maximise research productivity.

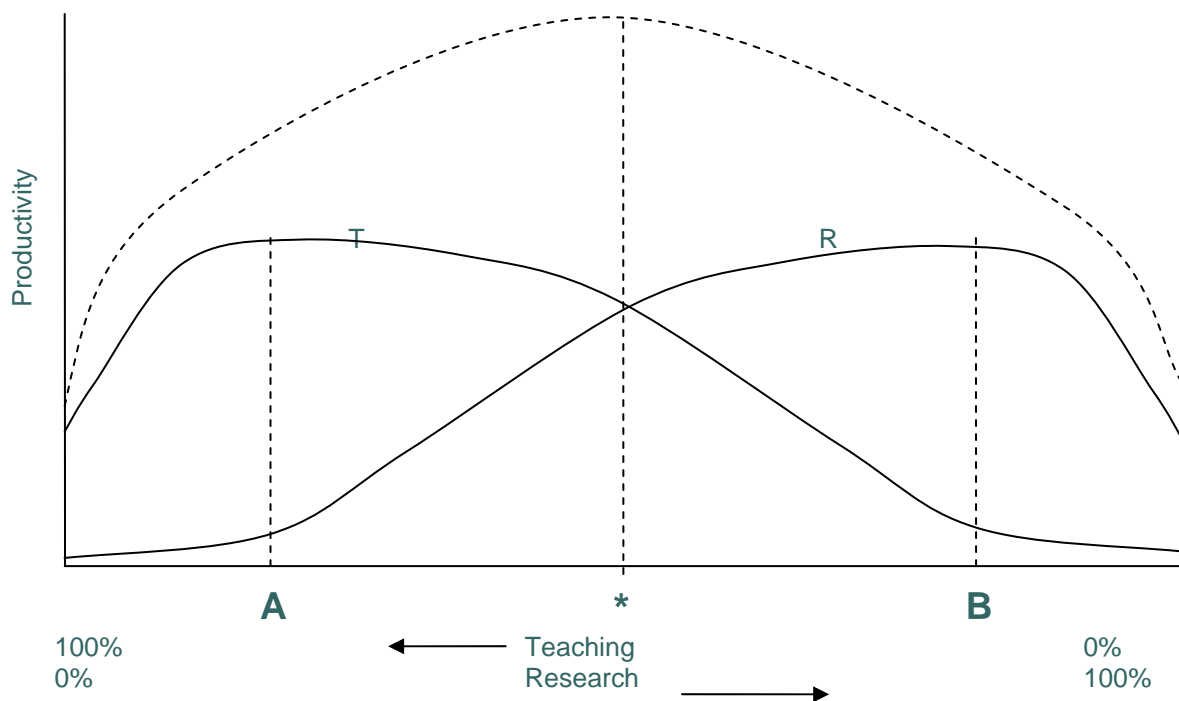


Figure 1: Rapid learning curves suggest a research-teaching balance can be an efficient strategy

The steepness of the curves and their relative shapes determine whether or not an equally balanced teacher-researcher policy is an efficient one or not. The curves indicate that high productivity can be reached in teaching and research without majoring on either in terms of time – consistent with rapid learning curves. The point of maximum joint productivity (the peak of the dashed curve) is 50:50 teaching: research (assuming symmetrical Teaching and Research curves). (It is interesting to note that time allocation formulae in at least one university I know of limits to 50%, the percentage of time an individual can spend on research – this being the percentage a 5-rated researcher is permitted). If learning curves are such that productivity gains require more extensive practice (Figure 2), then the joint productivity curve will bifurcate into two peaks, one associated with expert teachers doing a little research and the other with expert researchers doing a little teaching. A policy requiring

50:50 teaching: research is in no-one's interest under these circumstances, least of all students'.

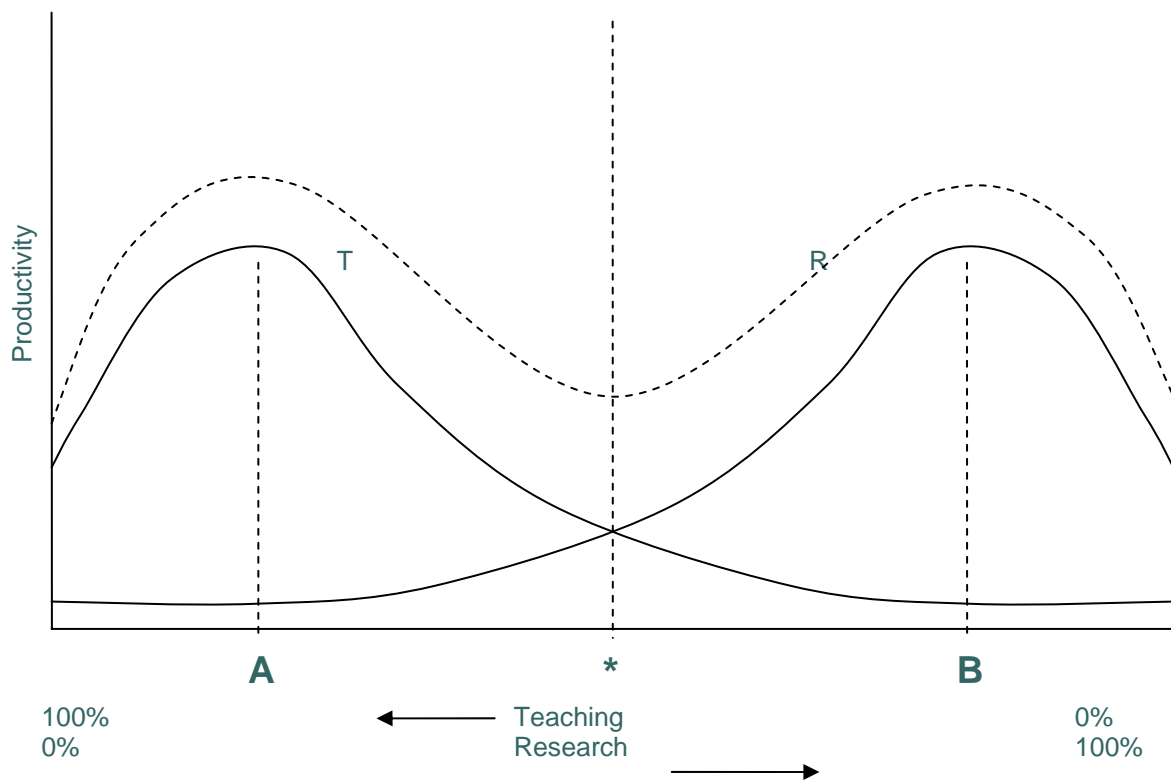


Figure 2: Steep learning curves lead to a natural force for specialisation

Assuming the existence of wider market and policy forces that lead institutions and individuals along trajectories that over time make them more efficient, such a policy is not only socially inefficient but also unstable – with inherent dangers for the stability of a university or indeed for an entire HE system.

The problem we all face is that while we might be motivated by both teaching and research and while our experience and the pedagogic research evidence might tell us that research and teaching are complementary activities, most of us feel that we no longer have the time to do both well. The feeling is compounded by the bureaucratisation of teaching and research, but it is wrong to blame the professionalisation of teaching agenda or research evaluation policies alone. Without either, it would still be true that knowledge about how to do teaching well is expanding rapidly and that the quantity of substantive subject-domain knowledge continues inexorably upward. One fears that in most subjects, Figure 2 better represents reality than Figure 1.

What strategies might we adopt in the light of this problem? Does it mean bowing to the processes of specialisation – a spontaneous or engineered move to a teacher-researcher split among universities or among academics within the same university, school or department? Several interventions to avoid or manage this suggest themselves.

First, departmental missions need to be set appropriately to resource endowments. Enlightened academic management strategies can help maximise research-teaching synergies and make life more bearable. They need to be grounded in the realities of time and cognitive limitations. Half a day a week is not enough to develop an international research profile; nor is one day a week: two is probably the minimum. If there are no viable strategies for releasing every member of staff in a school for at least a day a week, then the school's mission and policy should reflect this. It needs to allow its staff to specialise (within limits) and diversify.

Second, individuals can borrow from best practice and explore more efficient ways of achieving synergies within given institutional constraints. There are many papers suggesting effective ways of linking research and practice (see for example Roberts, 2007 and Jenkins *et al.*, 2007).

Third, while there is a role for quality enhancement and quality assurance processes, departmental and university managers should be acutely aware of the costs of any attempt to improve or enhance teaching that involve bureaucratic measures of monitoring. Cranking up the overheads of teaching means less time for research. UK universities seem to have settled down in this respect since the government's Quality Assurance Agency retreated to a more hands-off approach a few years ago. Under the current approach, universities have to demonstrate that they have suitable QA procedures in place and that they are effective and fit for purpose. This has to some extent shifted the conflict line from outside to inside the university, but it is probably more easily managed between employees of the same organisation.

Fourth, the scope for a better and more productive teaching-research balance can probably be improved by limiting the curriculum (linked to the idea of tighter subject focus in research – next point below). This would tend to move the curves more towards those in Figure 1. For applied and vocational subjects such as ours in the built environment, there are strong tendencies for knowledge domains to proliferate and curricula to creep, making Figure 2 the more likely dynamic, however. Research in our field also, tends to be more diverse and less focused, requiring us to keep up with an impossible scope of knowledge. It may be that scientists who research narrow fields and work with well defined knowledge domains that at least at the undergraduate level are prescribed and limited by tradition, are better able to handle a balanced workload of teaching and research. There is some evidence of this in our 2003 email survey. There are currently real opportunities to influence the nature of curricula in built environment subjects in UK universities, however. We could help ourselves and those we teach by looking for ways of drastically reducing the scope of knowledge purveyed. This poses an interesting challenge since it would seem to go against the current call from industry for more interdisciplinarity and more generalist skills. We need to watch this – since a move to, for example, a shared generalist built environment education at first and second undergraduate years, for example, is likely to drive a further wedge between teaching and research knowledge bases. That is not to say that such an approach is not desirable (University of Melbourne is pioneering a very impressive revamp of its entire undergraduate

programme along these lines). But it may well force us further down the lines of teacher specialists and we should be prepared for this.

Fifth, we need to think carefully about the type of research we do – research style and the nature of the research questions addressed. RAE peer review panels in all subjects will find themselves wondering about the significance and usefulness of some of the research papers they read. As a co-editor of a long established research journal I know that there is a growing quality ‘tail’ in research papers. The rejection rate of good journals is increasing. Actually, it is no-one’s longer term interest to go for quantity at the expense of quality, least of all students and other research consumers. Hopefully, changes in the RAE and more realism in university and departmental missions will give academics a chance to be less opportunist and less ‘flighty’ in research, enabling them to stay tuned to a narrower field with less effort. With a greater emphasis on metrics in future RAEs, individual academics and their managers will be forced take a reality check and ask the awkward question: who reads all these research papers? Impact Factors of journals and citation counts for individual papers provide indicators of intellectual footprints. It may be that by focusing once again on very narrow fields (this was once a more customary practice) and taking time to develop really useful empirical findings and theoretical ideas, academics are able to be both better teachers and better researchers. A metricised RAE relying more heavily on citation analysis could encourage this by incentivising academics to maximise impact not output. In fact, one of the more subtle unforeseen outcomes of past Research Assessment Exercises may well have been to incentivise academics to become generalised researchers – writing papers for the sake of it rather than in pursuit of specific knowledge. Synergies with teaching are unlikely to be realised where academics seek to maximise outputs (papers) or inputs (research grants). Academics locked into this unhelpful tradition are playing a zero-sum game in which their gains in research are balanced by losses in teaching. Synergies are more likely to be realised when researchers seek to maximise the quality and usefulness of research.

References

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