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Does University Research Improve University Teaching?

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Abstract

The Research Assessment Exercise (RAE) and the Quality Assurance Agency (QAA) generated a natural experiment in which UK universities strove to achieve the best results they could for their research and teaching. A review of the two exercises and a discussion of the relationship between university teaching and research appear in James (2005). This paper presents an analysis of the results for departments in Management and Economics.

1. Introduction

University research is widely thought to improve university teaching (see for example, Elton, 2001). HEFCE (2000) identified three main mechanisms by which teaching benefits from research and scholarly activity and these are summarised in Table 1. The first was direct knowledge-led benefits where student learning can gain from knowledge at the 'cutting edge'. Secondly there may be 'direct culture-led' benefits arising from students being exposed to a research culture. Thirdly there may be 'indirect resource-based' benefits whereby teaching can benefit from the resources made available for research and to beneficial effects on the reputation of institutions and the calibre of staff it can attract. In another survey Zaman (2004) has also identified a number of possible links between teaching and research.

The extent of such benefits is very difficult to measure. However, UK universities have been subject to extensive and detailed research of their research output by the Research Assessment Exercise (RAE) and teaching quality by the Quality Assurance Agency (QAA). These have generated a very large amount of data. Although as indicated below there are substantial difficulties in interpreting this data, it does provide a huge amount of information about the academic output of UK universities.

There has been some work examining the UK's research assessment results and teaching quality assessment (TQA). For example, Drennan and Beck (2001) examined the relationship between TQA scores and other variables. They took the mean TQA scores for all subjects across each institution with the mean RAE scores from the 1996 exercise. In order to isolate the contribution of research to teaching quality results the authors also took account of other factors, particularly the entry standards for students in terms of examination scores on entry, the staff/student ratio and spending on libraries and computers. Drennan and Beck found a significant correlation between TQA scores, student entry standards and RAE results. However, since that time there has been a further round of TQA inspections and RAE results. Furthermore their results were general ones across universities and

this paper focuses on Departments of Business and Management Studies and Departments of Economics.

Table 1 Reasons Why Research May Enhance Teaching

Knowledge – led benefits

Active researchers have expert and current knowledge in the field. Textbooks may not contain the latest developments in the field.

Students benefit from direct exposure to current methods and approaches involved in scholarly activity.

Culture-led benefits

Active researchers might be more successful in transmitting a critical approach rather than a passive acceptance of facts.

Students benefit from a spirit of enquiry and might be stimulated by the experience of being at the frontiers of knowledge.

Research increases the credibility of the teachers and thereby might increase the willingness of students to learn.

Research activity could help maintain the teacher's interest in the subject.

There may be a beneficial impact on the reputation of an institution that research can generate.

Indirect resource-based benefits

Teaching activity may share resources provided for research that would not otherwise be available.

Research attracts high quality staff. Furthermore personal abilities and skills necessary for excellence in research might also contribute to excellence in other areas of academic activity.

Research can increase lecturers' skills of communication, methodology as well as confidence and thereby improve their performance as teachers.

UK Universities

It may be helpful to look at the way universities in the UK have sometimes been categorised. A distinction is sometimes made between 'research-led' and 'teaching led' universities. Such a distinction is thought to be present in many countries, including the UK and the USA. In the UK the ancient universities are well known and have long traditions of teaching and research. Many more universities were established in the 19th and 20th centuries with similar missions of teaching and research. In a supposedly parallel development, polytechnics were established with a primary mission of teaching. The Polytechnics and Colleges Funding Council (PCFC) was formed in 1988 to allocate government funding across this sector but had only a small amount of money to support research. The 1992 Further and Higher Education Act led to most of the institutions covered by the PCFC being re-titled as universities. However, as noted for example by HEFCE (1997), the post 1992 universities 'had a stronger orientation toward professional education and multi-disciplinary study. Their smaller research portfolios were built up from consultancy or contract and applied work, sponsored by (often local) users'. In contrast HEFCE pointed out that 'all institutions funded by the Universities Funding Council were funded for research, and had reasonably similar amounts of teaching and research activity and similar disciplinary priorities'.

2. The Research Assessment Exercise and the Quality Assurance Agency

The Research Assessment Exercise

The Research Assessment Exercise (RAE) was set up to measure research output in higher education in the UK in order to form the basis of allocating public money for research. The RAE was first undertaken in 1986 and subsequently in 1989, 1992, 1996 and 2001. The following RAE took place in 2007 with the results due to be published in December 2008. The RAE was changed significantly in 1992 with the creation of the new universities largely from the established polytechnics and the setting up of new Higher Education Funding Councils.

For the 2001 RAE research was divided into subject areas, known as Units of Assessment (UoAs) and institutions of higher education were invited to make submissions to as many UoAs as they chose. Each submission contained a list of 'research active staff' with up to four research outputs per person for the previous five years in most subjects but seven years in most humanities subjects. The research outputs could consist of journal articles, books, book chapters and so on. Each UoA Panel then made judgements about the quality of the research submission and allocated a rating varying from 1 (excellence achieved in none or virtually none of the research submitted) up to 5* (more

than half the research at international levels of excellence). Further details of the rating scale and definitions are given in James (2005).

The RAE 2001: Overall Results

For the 2001 RAE There were 2,598 submissions from 173 institutions of higher education for the RAE 2001. The submissions represented the work of just over 48,000 researchers. The results were announced with claims that the RAE had substantially improved research output in the UK. As Table 2 shows, in 1996 31 per cent of research active academics worked in 573 departments rated at 5 or 5* (a substantial proportion of the work submitted was of 'international excellence'). In 2001 55 per cent of academics of research active staff were working in 1,081 departments rated at 5 or 5*. Furthermore 64 per cent of the work submitted was ranked at levels of national or international levels of excellence – ratings of 4, 5 or 5*.

Table 2 The Distribution of Staff and Departments in RAE Grades

	1996			2001		
Rating	Number of staff	Percentage of staff	Number of depts.	Number of staff	Percentage of staff	Number of depts
5*	5,173	10.8	170	8,975	18.7	326
5	9,610	20.0	403	17,278	36.0	755
4	13,263	27.6	671	11,913	24.8	690
3a	8,862	18.4	528	5,981	12.4	520
3b	5,233	10.9	422	2,635	5.5	279
2	4,329	9.0	464	1,144	2.4	140
1	1,625	3.4	236	94	0.2	18
Total	48,095	100	2894	48,020	100	2,728

Source: House of Commons (2002).

There have been reservations expressed that the improved scores were not entirely the result of improvements in research output but to some extent because UK universities were becoming more expert in manipulating the RAE system. The Parliamentary Science and Technology Committee considered certain concerns, for example of a possible adverse effect on teaching: 'If a strong financial incentive is introduced in one area of universities' activities, it cannot fail to have a negative effect elsewhere. It seems likely that the RAE has had this effect on teaching' (House of Commons, 2002, para. 48). The Committee thought that the RAE had distracted universities from other traditional contributions and concluded that:

The RAE has undoubtedly brought benefits but it has also caused collateral damage. It has damaged staff careers and it has distracted universities from their teaching, community and economic development roles. Higher education should encourage excellence in all these areas, not just in research (para. 59).

The RAE Results in Business and Management and in Economics

The RAE results are available on the Higher Education and Research Opportunities (HERO) website <http://www.hero.ac.uk/rae/Results/>. The outcomes for Business and Management Studies are discussed in the overview report RAE (2002a) and for Economics and Econometrics in RAE (2002b).

The Quality Assurance Agency

The Quality Assurance Agency was established to provide public assurance that the standards and quality in higher education are being safeguarded and enhanced (QAA, 2004). Further details of the process of teaching quality assessment (TQA) are given in James (2005) and it might be relevant to add that the present author was a specialist subject reviewer for this exercise. Essentially six aspects of teaching in a department were given a ranking ranging from 1 (aims and objectives not met) to a maximum of 4 (the aspect gave a full contribution to teaching) thus giving a theoretical 'total score' of between 4 and a maximum of 24.

3. Relationships Relating to RAE and QAA scores.

Limitations of the Data

There are limitations to the reliance that can be put on calculations based on data such as that generated by the RAE and the QAA – even though both produced a great deal of detailed information painstakingly collected about UK university departments - and these are discussed further in James (2005). Nevertheless it is worthwhile analysing this rich source of data.

Possible Relationships between Research and Teaching.

The RAE was conducted in the same way throughout the UK but the QAA reviews differed for Scotland and Wales. Therefore departments of Economics and Business and Management in English universities and Northern Ireland are included in these calculations but not those from Scotland or Wales.

For the purposes of statistical testing, the QAA results were divided into two groups. The higher-scoring group consisted of those achieving the 24 point maximum together with those just below at 23. Those who scored 22 or fewer overall points were included in the second group.

For the RAE those scoring 4 or 5 with virtually all their submitted output deemed to be of national or international excellence were put in the higher category and the rest - those scoring 2 or 3 – in the lower category.

The results for Business and Management are shown in Table 3 and for Economics in Table 4.

Table 3 Teaching Quality and Research Output in Departments of Business and Management in Universities in England and N. Ireland

		RAE 4 or 5	RAE 2 or 3
QAA Result	23 or 24	7	8
	20 to 22	7	15

N = 37, $\chi^2 = 0.836$, correlation = 0.149, p = 0.361

Table 4 Teaching Quality and Research Output in Departments of Economics in Universities in England and N. Ireland

		RAE 4 or 5	RAE 2 or 3
QAA Result	23 or 24	18	4
	20 to 22	6	5

N = 33, $\chi^2 = 2.75$, correlation = 0.277, p = 0.097

The pattern of results is consistent with high quality research being linked to teaching quality, but chi-square analysis generates no statistically significant association between higher scores in the RAE and higher scores in the QAA reviews for Business and Management. However, the results for Economics are significant at the 10 per cent level but not at the 5 per cent level. This result is discussed further below.

One interesting dimension is the comparative performance of 'pre-1992' or 'research-led' and new 'post-1992' or 'teaching-led' universities as described above. It is to be expected that the former would score better than the latter at high quality research and that is true both for Business and Management and for Economics.

There is no similar dominance of either sector in the QAA teaching scores. Table 5 presents the QAA results for Business and Management and for Economics. More departments are included in this calculation as many were covered by the QAA but did not submit to the RAE under the same subject headings. The results indicate that there is no significant difference in the QAA scores between the two categories of university. Even taking account of the serious limitations involved in using such data, it does not seem that high quality research is necessary for high quality teaching.

Table 5 Teaching Quality in 'research-led' and 'teaching-led' Universities in Economics and Business and Management in England and N. Ireland

		Universities	
		Pre-1992	Post-1992
QAA Result	23 or 24	15	32
	20 to 22	21	33

N = 101, $\chi^2 = 0.532$, correlation = 0.072, p = 0.465

4. Discussion and Further Research

As already indicated, there are limitations to analysing quantitative data of the sort considered here. It is very difficult to isolate the effects of research on teaching from the effects of the resources available to the institution, the staff and the students and other factors. There is scope for some further analysis of this kind on the basis of other information but, on the basis of the evidence so far, it does not seem that high quality research as defined by the RAE has a

very large and measurable benefit on the quality of teaching in Business and Management.

Nevertheless, within that general overall conclusion, while in Business and Management there is no statistically significant association between higher scores in the RAE and higher scores in the QAA reviews, the analysis indicates that for Economics the results are significant at the 10 per cent level though not at the 5 per cent level.

Such a result may have arisen for one or more of a range of reasons, not least of which is that there are a relatively small number of observations. However there are other possibilities. For example Business and Management departments often find students to be a more lucrative source of revenue than do Economics departments. Therefore the best Economics departments might spend more time and have come to be more effective in tapping the RAE source of research revenue than less successful Economics departments and Business and Management departments as a whole. For such reasons a good RAE score might also be personally more important for successful academics in Economics than it is for successful academics in Business and Management.

However, there is still the central question of the relationship between research and teaching and, in this case, high quality research as defined by the RAE and high quality teaching as defined by the QAA. One possibility is that the type of research that counts the most in the RAE, as described above, is more important for high-quality teaching in Economics than it is in Business and Management, though research in general might be just as important in both. This possibility would seem to be supported by the different range and type of subject matter taught in the two subject areas and, possibly, the most likely career paths of their graduates. In a report on the RAE, the UK Parliamentary Science and Technology Committee stated:

The RAE should recognise that excellent research may not be internationally significant but it may transform the fortunes of a local business or the provision of public services. We recommend that quality criteria concentrate more on the impact of research rather than the place where it has been published (House of Commons, 2004, para. 43).

Possibly if that had happened in the RAE there might have been a stronger relationship between excellent research and excellent teaching quality in Business and Management departments.

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