HEFCE Fundamental Review of Research Policy and Funding

Sub-group to consider the interaction between teaching, research and other activities of HEIs

Final report

Structure of the report

This report is structured around the major headings in our terms of reference:

Section 1: What is the impact on teaching of the drive to improve research, including:

- Does teaching subsidise research or vice-versa?
- What are the direct and indirect cross-benefits?
- Does undertaking research enable teacher-researchers to enhance the learning experience?
- Interaction between teaching and research at the institutional, departmental and individual level:
    - postgraduate research training and career development: the evidence base
    - postgraduate research training and career development: proposals for enhancement.

Section 2: How best to promote research activity synergistically with the promotion of high quality teaching and interaction with business and the community.

Section 3: How to ensure that institutions can develop excellent research and engage with the regional agenda, including:

- Should funding be targeted to support current, or future, regionally significant activities?
- How can promotion of excellence and international competitiveness on a national basis be best achieved without compromising institutions' ability to contribute fully to their regional economies and communities?
- Capability building.

Section 4: Can collaboration facilitate the different missions of HEIs?

Section 5: How to maximise the benefits of complementary funding by the HEFCE of teaching, research and work with business and the community.

The membership of the group is shown at Annex A and the terms of reference at Annex B

Executive summary

Teaching, scholarship and research

It was generally accepted in the 1960s and 1970s that university academic staff should undertake research, teaching and administration, with the accent heavily on the first. The funding of HE provided for all three, without attempting, either at an individual or institutional level, to distinguish between them, to judge their quality (except through appointment and promotion) or to measure their output.

The incorporation of the post-1992 universities into the Research Assessment Exercise (RAE) produced a turning point. The process and results of the 1992 RAE indicated there were now large numbers of academic staff in UK HEIs for whom the academic model, in the narrow sense that it had operated until 1992, was not appropriate.

Not all teaching staff are currently funded to do research or undertaking research of sufficient quality to achieve funding, although the block grant principle allows institutions to support their research if they wish to do so - thousands of students are being taught by those staff.

Teaching benefits from a range of research and scholarly activity. This beneficial synergy works in a variety of ways in different disciplines and institutions, but three main mechanisms have been provisionally identified:

- Direct knowledge-led. High quality research can provide very clear benefits to student learning, for instance through exposure to a curriculum informed by knowledge at the cutting-edge. This benefit is most often held to occur (and is perhaps most direct and effective) in postgraduate teaching and in the later years of undergraduate courses in the 'scientific' or laboratory-based disciplines.

- Direct culture-led. This may be seen as the benefit from exposing students to the spirit of enquiry and the research method, to the search for and analysis of data, and the consequent development of their capacity to advance and defend theories and to subject ideas to critical analysis. This benefit is as clear in the arts, humanities and social sciences as in the natural sciences.

- Indirect resource-based. Teaching can benefit from sharing the resources provided for research, from the role of research in attracting high calibre staff to institutions and departments, and the generally beneficial impact on reputation and resources which research can bring to departments and institutions.

We consider that developing an improved research profile can have direct benefits for teaching and that the ability of institutions to offer research facilities and opportunities for their staff is an important and

pervasive indirect benefit. However, the JM Consulting study on the interactions between research, teaching and other activities suggests that institutional policies to extract synergies are patchy and variable in effectiveness.

There is little evidence that HEFCE policies have promoted research at the expense of teaching. Rather higher education is continuing to achieve significant increases in productivity, and this is at least in part a function of the generally synergistic relationship between teaching and research. However, there is some concern that the point is being reached at which a further increase in productivity cannot be achieved without transformational change.

On the basis of the findings above, we believe that teaching in higher education must be underpinned by a base of research or scholarship.

We believe that scholarship is an activity that teachers in higher education need to carry out, that can be distinguished from research, and that researchers also need to carry out in order to inform their teaching. Individual research can be specialised, whereas scholarship is considered to be the linking and synthesis of general developments in a subject, using the insights gained from well-developed powers of critical appraisal.

We consider that all teaching in HE should be underpinned by scholarship, and that all HE teachers should have been engaged in research at some stage in their careers, so that they can bring a critical analytical faculty to bear on the subject.

This might be argued to mean that staff at research-intensive institutions are funded twice by the HEFCE for their scholarship, once through teaching funds and once through research funds, but we do not believe that this is necessarily the case. Many research specialisms are so narrow that without additional scholarship the research activity alone would not provide a suitable base for HE teaching. There is therefore a need for scholarship to support teaching in both research-intensive and teaching-led institutions. Indeed, we believe that one of the strengths of the UK system, compared with the USA, is the obligation on almost all academic staff to maintain a basis of scholarship in order to teach, as this also makes them better researchers.

Research funds are allocated by the Funding Council against research criteria and for research outcomes, but scholarship is primarily a requisite for teaching rather than research, and the outcomes of scholarship are primarily teaching outcomes. We do not, therefore, believe there is a case for the application of research funds to support scholarship. Scholarship is intimately related to teaching, it is essential underpinning of the HE teaching experience and should be recognised as such by being met in full from the teaching funding stream

We believe that staff recruited to teaching-led institutions can make a valuable contribution to the research effort, and such an experience often provides a gateway to a research career. We believe that the opportunity to engage in research remains one of the most important factors in motivating individuals to enter and remain in the academic profession. This is one of the most important ways in which research benefits teaching, and it is an important justification for institutions' continued ability, which the block grant provides, to invest funds in the way they feel optimises their activities.

Establishing funding for disciplines

The amount of funding associated with each unit of assessment (UoA) is in large part determined by the number of research active staff submitted to the RAE, which in turn is a reflection of the number of teacher-researchers recruited to meet demand for undergraduate teaching. This means, for instance, that the 'pot sizes' for quality-related (QR) funding to some extent reflect the historic pattern of student demand prior to the elimination of the binary line between universities and polytechnics (though changed by subsequent growth in specific areas that have proved popular, such as art and design and media studies). This is reinforced by the fact that the funding cost weights reflect institutional expenditure, which in turn reflect allocations – there is a circularity at work. We therefore recommend that the HEFCE review the basis on which the QR pot sizes are established, using more than just institutional expenditure returns.

Research training and career development

One consequence of the increasing emphasis on research has been an increasing eagerness on the part of institutions to recruit postgraduates, both taught and research. There are currently 62,300 postgraduate research students in England. The major area of growth is in the number of institutionally-funded studentships. There was substantial growth after the elimination of the binary line between universities and polytechnics in 1992, but this stabilised prior to the 1996 RAE and the number has remained roughly constant since. The statistics show that this growth has occurred throughout the sector, with a similar rate of increase in both pre- and post-1992 institutions, so it is probably related, at least in part, to the funding incentives provided by the Funding Council's research funding model.

We are concerned that the rapid expansion of postgraduate research activity in the sector, coupled with the determination of many institutions to develop their research profile, in some cases from a very low base, has resulted in an inappropriate dispersal of postgraduate research trainees. As a result some of these trainees are isolated, lack physical and intellectual support, and do not receive a level of training that prepares them either for career in academe or outside it.

Responses to the Call for Evidence shared our concerns and showed widespread support for a move towards greater concentration of research training. Our concern is to balance the legitimate aspiration of institutions to develop their research capability with the rights of students to receive an appropriate research training. The issues would seem to us to be as follows:

- increasingly the range of research skills and experiences students require cannot be supplied by a single thesis supervisor; this holds just as much in the arts and humanities as in the sciences

- there are significant economies of scale in the delivery of research training, particularly the generic skills acquired early in the training experience

- increasingly, globalisation requires that students' training experiences expose them to world class facilities and world class researchers

- there is an increasing need to teach supervisory skills and this may be facilitated by collaboration.

We have therefore devoted considerable attention to considering what mechanisms and structures could be developed to enhance the development of research people. Our criteria for the model were that it must:

- assist young researchers up to and including their first established post, although focused on postgraduate researchers.

- be sensitive to the different research training cultures and career progression pathways in different disciplines

- avoid reinforcing disciplinary boundaries

- facilitate the concentration of training activities, in order to achieve critical mass

- impact on institutional practice, providing opportunities and incentives for best practice to be shared.

The effects of the model on 'barriers to entry' to postgraduate research (PGR) provision must also be considered, because of potential knock-on effects on selectivity.

We consider that three of the five options that we explored could meet these requirements:
- research training support networks
- collaborative graduate schools
- the Scotdoc model.

We believe that there is some benefit in allowing institutions to choose which approach is best for them, given their particular circumstances. It would then be the role of the HEFCE to establish minimum criteria and assess the outcome of the provision against these criteria. Such a process would need to be related to the RAE, but could be separate from it.

Regionality

All regions present academics with research opportunities, either because organisations in a region sponsor or collaborate in research activity, or because regional social, economic or other factors may themselves form a topic for research.

However, we believe it is erroneous to suggest that there is a dichotomy between research of international quality and regional relevance. We do not believe that there is any inherent conflict between developing excellent research and engaging with the regional agenda. Rather we feel that research can become parochial and inward looking if it is not linked to the wider research effort. In addition, excessive focus on incremental regional research may mean that transformational national or global developments are not embraced. The consultancy study we commissioned confirmed that researchers do not see regional links as sufficient to sustain leading-edge research capability on their own. Many consider that the regional impacts of their research will be maximised through an outward looking (national and global) approach rather than an inward focus on the region.

Capability development

We have heard about a number of areas that would not have developed without specific funding, because of 'market failure', and we do not believe that the need for such funding has reduced. Rather, we believe there is a case to develop a funding stream to build capability where there has been a research 'market failure'.

We believe that institutional autonomy is key to the ability of the sector to respond to stakeholders' demands, and clearly the development of new research areas is a feature of this response. The PREST survey of institutional allocation systems, undertaken to inform the review, demonstrates that institutions tend to follow HEFCE allocations very closely in their own internal allocation procedures. This raises the question of whether HEFCE funding policies do enough to preserve the freedom of institutional managers to invest in new areas. We therefore welcome the suggestion of the nature and purpose sub-group that a separate funding stream is developed to support the development of strategically important emerging areas

Collaboration

The promotion of collaboration has implications for institutional autonomy and governance. In particular the direct funding of research groups rather than institutions might create uncertainties about who is, or

could be, accountable for the use of public funds allocated to such groups. The consultants found little enthusiasm for the direct funding of collaboration for research activity, and we agree that there is no case for promoting collaborative research within the UK HE system as an end in itself. However, we do consider that explicit measures are required to promote collaboration in the provision of research training. We recognise that, though not without its problems, EU funding does promote international collaboration, and we would welcome UK measures to promote and support international collaboration.

Key policy-related conclusions

- Strong funding and esteem drivers mean most staff and institutions wish to engage in research.

- There are now large numbers of academic staff in UK higher education institutions (HEIs) for whom the academic model, in the narrow sense that it operated until 1992, is not appropriate.

- There is a beneficial synergy between teaching and research that works in a variety of ways in different disciplines and institutions and there is no common language or assumptions to describe the relationships between teaching and research. The relationship is changing as a result of IT and moves to greater student learning as opposed to teaching.

- The opportunity to do research is important in recruiting, retaining and motivating staff. Eroding the ability of staff in particular institutions, disciplines or at certain career stages to undertake research would deleteriously affect the recruitment, retention and motivation of staff. Therefore the block grant principle, which allows institutions to support the research of staff even when they have not won external funding, must be maintained in order to sustain the quality of the staff employed in the sector.

- The agenda for higher education has changed. HEIs are central to efforts to support the development of the knowledge economy and social inclusion, both of which have a significant regional dimension.

- Institutional autonomy is key to the responsiveness of HEIs to users and stakeholders whether regionally or internationally focused.

- Current funding policy may promote convergence rather than diversity.

Associated conclusions

- New research is emerging not just in the margins between disciplines but in entirely new disciplines. These new disciplines are challenging conventional ideas of what research is, how it is organised and what its functions are.

- Public funding sources cover the direct costs of both teaching and research and may make some contribution to common core costs.

- The promotion of high quality research should not be assumed to pull organisations away from the promotion of high quality teaching, interaction with business and the community, or engaging with the regional agenda.

- Research collaborations tend to be highly individual, impermanent and discipline-based.

- It can be easier to develop collaborations between the same disciplines in different institutions than between different disciplines in the same institution.

- Much inter-institutional collaboration is driven by the need for institutions to deal with third parties, such as the EU.

- The promotion of collaboration has implications for institutional autonomy and governance.

- Geographical proximity is useful but not of key importance in collaborative research. Proximity is more important for technology transfer activity.

- HEIs recognise their importance to the region but this is not always incorporated into research strategies.

Key recommendations

- Because of the demonstrable benefits at the level of the individual, unit and institution, we recommend that all HE teaching should be underpinned by research or scholarship. We also recommend that teaching funding should meet the full costs of delivering teaching, including the costs of the scholarship necessary to support it.

- The evidence presented to us shows that collaboration in UK research is healthy and pervasive: it is the rule, not the exception. However, we believe there is scope for greater collaboration between institutions to deliver research training. The growth in postgraduate research numbers over recent years, and the increased dispersal of these postgraduates over many institutions, suggests to us that collaboration between institutions is necessary to ensure the best possible research training and career development for these individuals. We recommend that physical or virtual concentration of research training is required in order to provide sufficient critical mass to provide enhanced research training and career development for those who have recently embarked on a career in research.

- We also recommend that there should be funding stream, in addition to QR, that supports strategic decision making within HEIs, but which allows capability to be developed in areas where there is market failure.

- We have explored the basis for establishing research subject quanta in relation to staff (essentially student) numbers. We have found, as expected, that the relationship between staff and student numbers, and institutional and departmental income and expenditure, is complex and we consider this to be indicative of active institutional management. Student numbers are increasing in areas important to the new economy and this, by increasing the number of teacher-researchers, serves to develop the research base in new areas. We conclude, therefore, that there is no *a priori* evidence that the current approach to establishing the quanta is inappropriate. However, given the complex relationship between staff, students and income, and the need to ensure that different areas of research are appropriately supported, we recommend that the HEFCE establishes a mechanism to examine this issue further.

Background

1. It was generally accepted in the 1960s and 1970s that university teachers were expected to undertake research, teaching and administration, with the accent heavily on the first. The funding of HE provided for all three, without attempting, either at an individual or institutional level, to distinguish between them, to judge their quality (except through appointment and promotion), or to measure their output. The only exception was a diary exercise in the late 1970s, which sought to explore the workload of academics. This indicated that academic staff members were spending about one-third of their time on each of the three components of their profession.

2. In 1986 the University Grants Committee (UGC) ran the first Research Selectivity Exercise to enable funding to 'take account of work of special strength and promise, so as to maintain the quality of research in UK universities'. However, the background was one in which there was considerable concern about the return the country was getting for a research budget that was one-third of the total HE budget.

3. The third exercise, in 1992, was undertaken jointly by the now separate English, Welsh and Scottish Funding Councils. Although the exercise was broadly similar to that in 1989, the ability of the former polytechnics to make submissions and a transfer of funding from the Funding Councils to the Research Councils was associated with some changes. Most notable were that institutions no longer had to submit all staff; that submissions could be made in each unit of assessment (UoA) for one or both of two categories – applied and basic research - but that less money would be available for applied research; and no funding would be associated with the lowest quality rating.

4. Although the first RAE by implication assessed research as a separate activity from teaching, it remained an article of faith that all HE teachers should be engaged in research. The new universities were therefore incorporated into a system in which all HE academic staff were expected to undertake research, teaching and administration, and in particular that all staff would be research active. In the 1992 RAE, most new universities chose to submit only a small proportion of their staff, and many of those were in departments that achieved ratings that were not funded. The quantity of explicit research funding from either the National Advisory Board (NAB) or the Polytechnics and Colleges Funding Council (PCFC) had been very small, certainly less than 5 per cent of total funding to the new universities. Despite this, many staff in the new universities had been enabled to undertake research by relieving them from timetabled teaching and other means, reflecting the nature of staff contracts which were more prescriptive than in the old universities. Many staff, however, had either never undertaken research or had ceased to do so.

5. The incorporation of the post-1992 universities into the RAE process produced a turning point. The process and results of the 1992 RAE indicated there were now large numbers of academic staff in UK HEIs for whom the academic model, in the narrow sense that it had operated until 1992, was not

appropriate. Not all teaching staff are currently funded to do research or undertaking research of sufficient quality to achieve funding, although the block grant principle allows institutions to support their research if they wish to do so - thousands of students are being taught by those staff.

6. The creation of a unitary sector has encouraged many institutions which were formerly funded by the PCFC to develop their research missions to an unprecedented degree. Many former Universities Funding Council (UFC) institutions have also chosen to place greater emphasis on their research missions. One consequence of this has been an increasing eagerness on the part of institutions to recruit postgraduates, both taught and research. In 1996 the Harris *Review of Postgraduate Education* noted 11 per cent per annum growth in postgraduate numbers in HEFCE-funded institutions between the years 1992-93 and 1994-95, with 63,100 postgraduate research students in English institutions in 1994-95. Taught postgraduate students are outside our remit, but there has been no significant decline in numbers of postgraduate researchers. Data we examined for 1999-2000 show that there are 62,300 postgraduate research students in England. For these students the interaction between teaching and research is of great significance and we have considered the current quality of provision for them, and made recommendations.

7. We explored the relationship between teaching, scholarship and research and the approaches required to support and develop institutions in this new reality. However, we recognise that the words ‘research’ and ‘scholarship’ in particular carry many different meanings. Some use the word 'scholarship' to refer to the production of academic tools, such as dictionaries, which support research as much as, or more than, they support teaching. This definition has a concept of altruism, breadth and engagement with the discipline which is in common with the concept we are using of scholarship as an activity underpinning teaching, but can be distinguished from it. In 1990 Ernest Boyer described academic work in terms of four forms of scholarship: the scholarship of discovery, the scholarship of teaching, the scholarship of application and the scholarship of integration. Our primary concern has been with the scholarship of integration.

8. Central to the concept of research is the extension of knowledge, but extending knowledge does not necessarily imply the generation of new information: knowledge can be extended, for instance in the humanities, by new interpretation of existing sources and data. In distinguishing between research and scholarship we note that the latter might include analysis, synthesis and criticism of research, but the added value would not necessarily be generalisable. Clearly this can be distinguished from “scholarship” activities in the arts and humanities than fall within the RAE definition of research such contributing to the Dictionary of National Biography. We believe that scholarship is an activity that teachers in higher education need to carry out, that can be distinguished from research, and that researchers also need to carry out in order to inform their teaching. Individual research can be specialised, whereas scholarship is considered to be the linking and synthesis of general developments

in a subject, using the insights gained from well-developed powers of critical appraisal. It is argued that all teaching in HE should be underpinned by scholarship and that all HE teachers should have been engaged in research at some stage in their careers, in order that they can bring a critical analytical faculty to bear on the subject. It is noted that in the USA individuals rarely teach outside their research area, whereas this is one of the strengths of the UK system.

9. We use the term 'research' in its broadest sense, since much activity in the sector does not fit neatly into the traditional categories. Innovative activities within HEIs that lead rapidly to new product development or close collaboration with users and the formation of strategic relationships is neither 'basic', 'strategic' nor 'applied' research, nor is it 'development'. 'Policy-focused' research, such as in education or health is a further example of a new type of activity. New research is emerging not just in the margins between disciplines but in entirely new disciplines, and these new disciplines are challenging conventional ideas of what research is, how it is organised and what its functions are. This is perhaps especially true in disciplines such as art and design or nursing, which lack the well-established research traditions of chemistry or physics. In consequence these disciplines are developing new ways of interacting with the users of their research (who are often quite different in character from the users of, for instance, research in chemistry). Even the well-established disciplines, however, are evolving new styles of research as industry seeks to change the basis of its relationship with higher education.

Section 1: What is the impact on teaching of the drive to improve research? Have HEFCE policies promoted research at the expense of teaching?

10. There is widespread concern that the drive to improve research has had deleterious effects on teaching. Among the concerns expressed have been that it has produced a separation of, and an antagonism between, research and teaching, partly due to the fact that rewards are available for developing research excellence which are not available for developing excellent teaching. This problem is held to have been exacerbated by the increasing accountability burden on staff in institutions.

11. We have devoted considerable attention to gathering and analysing information on the interaction between teaching and research, to establish evidence on which to base our conclusions about the interaction between teaching and research. As a key part of this approach, we commissioned a substantial research study from a consortium including JM Consulting, the Commonwealth Higher Education Management Service and the Institute of Education. This consortium provides a breadth of expertise to explore issues relating to the teaching and research interface. Much of the evidence to support the conclusions of the sub-group is contained within the JM Consulting consortium report. The key findings include:

a. Strong funding and esteem drivers mean most staff and institutions wish to engage in research.

b. Teaching is less driven than research and its quality is more difficult to assess.

c. Teaching benefits from a range of research and scholarly activity. This beneficial synergy works in a variety of ways in different disciplines and institutions, but three main mechanisms have been provisionally identified:

- Direct knowledge-led. High quality research can provide very clear benefits to student learning, for instance through exposure to a curriculum informed by knowledge at the cutting-edge. This benefit is most often held to occur (and is perhaps most direct and effective) in postgraduate teaching and in the later years of undergraduate courses in the 'scientific' or laboratory-based disciplines.

- Direct culture-led. This may be seen as the benefit in exposing students to the spirit of enquiry and the research method, to the search for and analysis of data, and the consequent development of their capacity to advance and defend theories and to subject ideas to critical analysis. This benefit is as clear in the arts, humanities and social sciences, as in the natural sciences.

- Indirect resource-based. Teaching can benefit from sharing the resources provided for research, from the role of research in attracting high calibre staff to institutions and

departments, and the generally beneficial impact on reputation and resources which research can bring to departments and institutions.

d. The HE teaching base contributes to development of world class research. There appear to be three main mechanisms by which this is achieved:

- direct stimulation and challenge of critical thinking which contact with students brings to researchers
- the research outputs generated by students during course work and through projects associated with them
- through inspiring and creating the research leaders of the future.

e. There is no common language or assumptions to describe the relationships between teaching and research.

f. Synergy between research and teaching does not occur automatically, it has to be managed at the level of the individual, research group, department or institution.

g. Institutional policies to manage the synergistic relationship between research and teaching are generally weak and patchy.

h. Pressures on academic staff may be compartmentalising activity and this may threaten the extraction of these beneficial synergies.

i. Research may be being subsidised by institutions (though not generally at the expense of publicly funded teaching).

j. There are strong synergies between 'other' activities and both teaching and research.

12. JM Consulting found some evidence that increasing pressure on academic time (partly due to an increase in research activity, but also from teaching assessments, new approaches to teaching and learning, new technologies and widening access to new types of student) is leading to some specialisation by individual academics in teaching, or research, or other activities. However, this is not a widespread phenomenon and there is no evidence of an impact on quality. Evidence was sometimes found of poor management of the teaching and research assessment processes in individual departments, leading to demotivation of the staff concerned. However, it seems that the concern to ensure the achievement of high Teaching Quality Assessment (TQA) scores provides an underpinning for teaching quality against any potential deterioration from the competing demands of other activities.

13. This is consistent with responses from some post-1992 universities to the Call for Evidence, which noted the increasing pressures from engaging with the research agenda but suggested that the drive to improve research was significantly benefiting teaching in their own institutions. This finding was also confirmed by responses from academic staff in interviews conducted with them by the consultants. Many staff noted that as a result of increasing their research activity they had been able to establish better relationships with their students and were better able to communicate their engagement with the subject. We believe that this is important evidence – that teaching-led institutions have found their teaching improved through appropriate and well-managed engagement with the research agenda.

14. We believe that staff recruited to teaching-led institutions can make a valuable contribution to the research effort, and such an experience often provides a gateway to a research career. We believe that the opportunity to engage in research remains one of the most important factors in motivating individuals to enter and remain in the academic profession. This is one of the most important ways in which research benefits teaching, and it is an important justification for institutions' continued ability, which the block grant provides, to invest funds in the way they feel optimises their activities.

Conclusion

15. There is little evidence that HEFCE policies have promoted research at the expense of teaching. Rather HE is continuing to achieve significant increases in productivity, and this is at least in part a function of the synergistic relationship between teaching and research.

16. We have observed that developing research can have direct benefits for teaching, and that the ability of institutions to offer research facilities and opportunities for their staff is an important and pervasive indirect benefit. However, the JM Consulting study suggests that institutional policies to extract synergies are patchy and variable in effectiveness.

17. There is some concern that the point is being reached at which a further increase in productivity cannot be achieved without transformational change.

Does teaching subsidise research or vice-versa?

18. Evidence from the JM Consulting study indicates that:

a. Institutions are subsidising both publicly-funded teaching and publicly-funded research. This subsidy may come from income provided for the institutions' other activities, running down of capital or additional hours worked by staff.

b. It is difficult to attribute some costs meaningfully to either teaching or research (for example general library resources, academic staff offices, etc). In addition, research may sometimes be undertaken at a marginal cost to institutions (staff do it in their own time because they feel it to be their vocation). We noted that a transparency review is being undertaken in the USA which assumes that teaching and research costs cannot be separated.

c, Public funding sources cover the direct costs of both teaching and research and may make some contribution to common core costs.

d. There has been focus recently on the needs for enhanced research infrastructure provision. In future there might be a necessity for greater concentration on the needs of teaching infrastructure.

What are the direct and indirect cross-benefits?

19. As detailed above, the findings from the JM Consulting study indicate that, although generally positive, the intellectual relationship between teaching and research is different depending on the institution, the department and the individual. It is also changing as a result of the impact of IT and the shift from teaching to learning.

20. The consultancy study also confirmed that the opportunity to do research is an important reason why able people embark on an academic career, and that this is one of the most important benefits to teaching of the drive to improve research. We believe that eroding the ability of staff in particular institutions, disciplines or at certain career stages to undertake research would deleteriously affect the recruitment, retention and motivation of staff.

21. We believe that staff recruited to teaching-led institutions can make a valuable contribution to the research effort, and such experiences often provide a gateway to a research career. Talent will be lost to the sector if teaching-led institutions do not retain the freedom to invest in those of their staff who prove to be excellent researchers.

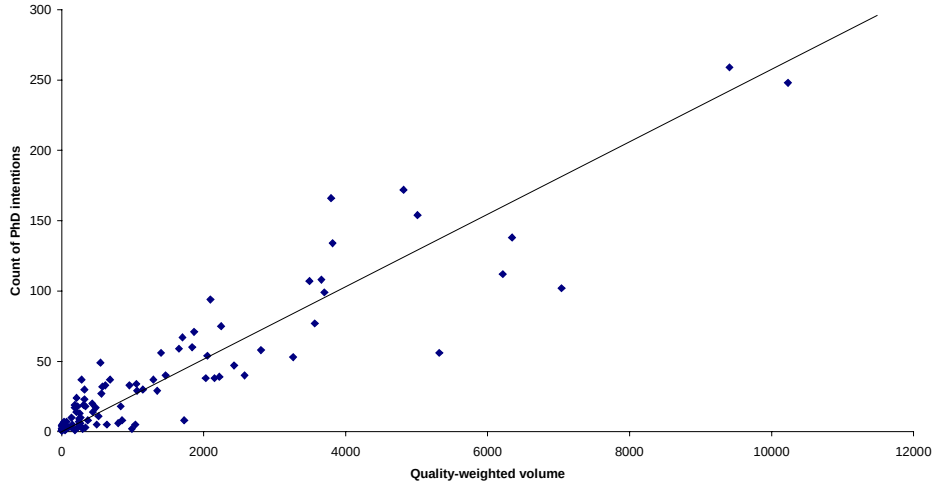
22. There are also benefits to teaching from research through curriculum development and the development of a culture of critical appraisal. The consultants noted the views expressed by academic staff that as a result of increasing their research activity they had been able to establish better

relationships with their students and were better able to communicate their engagement with the subject.

23. The JM Consulting report suggests that this synergistic benefit is most clear at third year undergraduate and postgraduate taught levels. In order to explore this further we looked at how the research intensity of an institution (the 1996 RAE rating multiplied by the number of research active staff) affects the number of students intending to go on to do a PhD.

24. Figure 1 shows a strong correlation between the research intensity of an institution and the number of undergraduate students intending to do a PhD. However, there are number of potential explanations for this relationship. For instance, the research-intensive institutions may recruit individuals who are more likely to want to go on to more advanced levels of study. It could also be the case that the level of student debt is affecting choices on whether to pursue an advanced degree, as it is known that research-intensive institutions generally attract students from more affluent neighbourhoods. Further analysis is necessary to unpack the basis of the relationship between research intensity and PhD intentions. However, there is little doubt there is a positive relationship.

Figure 1: Effect of research intensiveness on PhD intensions 1994-95



Does undertaking research enable teacher-researchers to enhance the learning experience?

25. On the basis of the findings above, we believe that teaching in higher education must be underpinned by a base of research or scholarship.

26. We see 'scholarship' as intimately related to, but separate from, research. It is true that in some of the humanities the activities that we consider to comprise scholarship would be difficult to distinguish from research, and some activities termed "scholarship", such as contributing to the Dictionary of national Biography, clearly fall within the RAE definition of research. However, in other disciplines the distinction between the two is clearer. Furthermore, as stated above, we can conceive of a researcher whose interests are not sufficiently broad to support an appropriate level of scholarship to underpin teaching. However, it is also the case that scholarship is not necessarily dependent on links to classic forms of research. The scholarship required to inform teaching may be closely linked to professional or practice-based activities in some disciplines, to consultancy or work with industry in others. We believe it is the scholar him or herself who is best able to identify the appropriate sphere for his or her activities.

27. In this respect scholarship does not differ in kind from the continuous professional development expected of other professions. There must of course be a source of funding for this activity. It may be considered to come from the current research funding streams, or from the teaching funding stream, or a case may be made, as it was by the National Committee of Inquiry into Higher Education, for a new stream of funding explicitly for the support of scholarship. We have considered the pros and cons of these three propositions.

a. A separate funding stream for scholarship would provide for institutions with lower staff/student ratios and, even though this may have no direct impact on class sizes, it would be easier for the department to manage teaching loads and free-up time for research and scholarship. However, to fund scholarship separately from teaching implies that the two activities are separable, whereas we believe that they are not. Also, the outputs of scholarship are difficult to capture, it would therefore be difficult to establish what this separate funding stream would be 'buying'. We do not recommend this approach.

b. Research funds are allocated by the HEFCE against research criteria and for research outcomes, but scholarship is primarily a requisite for teaching rather than research, and the outcomes of scholarship are primarily teaching outcomes. We do not, therefore, believe there is a case for the application of research funds to support scholarship.

c. We therefore reject the suggestion that there should be a separate stream of funding for scholarship, or that research funding should be the source of funding for scholarship. Scholarship is intimately related to teaching, it is essential underpinning of the HE teaching experience and should be recognised as such by being met in full from the teaching funding stream.

28. We recognise that this might be argued to mean that staff at research-intensive institutions are funded twice by the HEFCE for their scholarship, once through teaching funds and once through research funds, but we do not believe that this is necessarily the case. Many research specialisms are so narrow that without additional scholarship the research activity alone would not provide a suitable base for HE teaching. There is therefore a need for scholarship to support teaching in both research-intensive and teaching-led institutions. Indeed, we believe that one of the strengths of the UK system, compared with the USA, is the obligation on almost all academic staff to maintain a basis of scholarship in order to teach, as this also makes them better researchers.

29. Our position that scholarship should be met in full from the teaching funding stream is dependent on there not being a further significant increase in selectivity, as this might reduce staff student ratios in some institutions to the point at which an additional source of funding would be needed to purchase time to engage in scholarship. Alternatively, there would need to be a massive change in teaching methods in some institutions, as staff would not have time to do scholarship. We believe that such a change would undermine the nature of higher education in these institutions.

30. There are also significant institutional management issues. We believe that as human resource management structures in the sector improve, there will be more support and guidance for staff in this area. We note, however, that new roles are evolving in institutions in support of student learning, alongside the traditional academic teacher, for whom the notion of scholarship as classically defined might not be appropriate. Definitions of the nature and purpose of scholarship must be sensitive to the roles of such staff.

31. The nature of an academic career is changing and we recommend that the HEFCE should assist institutions in facilitating the change. However, we believe that engaging in both teaching and research is central to the concept of an 'academic career' and that all HE teachers should have engaged in research at some stage in their careers.

32. We also considered the need for researchers to stay abreast of current developments in their field. Retraining opportunities should be available for staff where appropriate, and this will be facilitated as part of the improvement in human resource management structures in the sector. However, most staff see it as part of their job to keep themselves up-to-date with developments in their field – as research evolves, the interests of staff should evolve in parallel. Academic staff are themselves better placed than institutional managers to ensure that their research activity remains relevant.

<u>Interaction between teaching and research at the institutional, departmental and individual level</u>

33. The amount of funding associated with each UoA is in large part determined by the number of research active staff submitted to the RAE, which in turn is a reflection of the number of teacher-researchers recruited to meet demand for undergraduate teaching. This means, for instance, that the

'pot sizes' for quality-related (QR) funding to some extent reflect the historic pattern of student demand prior to the elimination of the binary line between universities and polytechnics, though changed by subsequent growth in some areas that have proved popular, such as art and design and media studies.

34. It is clear that the 'barriers to entry' differ between subjects: it may be costly to develop new or additional provision in the experimental sciences, for instance.

35. It has been suggested that while some money flowed to support these new areas, seldom was there a commensurate fall in support for areas with declining student numbers. It is certainly arguable whether the level of research funding in some areas is consistent with what would seem appropriate given national need. However, although student demand for some core disciplines such as physics is declining, research in these subjects remains important as underpinning for both broader undergraduate science subjects and research in related areas.

36. We acknowledge that the ability to offer research facilities is key to the ability of institutions to recruit able people, even for predominantly teaching posts. There are therefore positive reasons for linking research allocations to the number of teacher-researchers. Although a logical argument could be constructed for separating research from teaching, the fact that in most institutions it is the same people who are engaged in delivering both activities means that in practice the two are not separable.

37. In order to better understand this relationship we commissioned an analysis of the link between institutional income, staff numbers and student numbers. The analysis is necessarily rather simplistic compared with the complex social and organisational behaviour being explored, so it needs to be interpreted with caution.

38. However, it is clear from Figures 1 to 7 in Annex D that changes in student numbers are broadly correlated with changes in staff numbers at the sector, disciplinary and departmental level.

39. Further, it is clear from Figures 8 to 14 in Annex D that there is a correlation between staff numbers and income and expenditure. (We have seen, but do not show, evidence that income and expenditure at the departmental level are very closely correlated.) It is particularly noticeable that at low levels of increases in income from all sources – that is, below £10 million, which is actually associated with a real terms decrease or real terms standstill – there is no pattern to staff recruitment. As one moves into the zone of significant increase, above £20 million, it is clear that there is a positive relationship between increasing income and increasing numbers of staff.

40. However, this analysis does not support the simple proposition that increases in research income have been associated with markedly disproportionate increases in staff numbers. Rather a more complex picture emerges, including some evidence of sophisticated and active management of staff numbers by institutional managers.

41. We believe that the increasing throughput of undergraduate students with a declining unit of resource makes it difficult for institutions to respond as rapidly and as significantly as they might like to opportunities that arise in new areas. The costs of institutions are mostly associated with staff, many of whom are on permanent contracts and would be expensive to release. Therefore disinvestment in areas where the institution has decided to scale down, rather than bolster, activity is also difficult to achieve. It was acknowledged that in a people business that sought to build capability for the longer term, and to respect the contribution that staff had made when circumstances changed, there would always be a lag between changes in funding and changes in staffing levels.

42. More positively, we believe that staff are flexible and can change their areas of focus, either between activities or between disciplines. It was recognised, in particular, that institutions actively manage the workload of staff to rebalance their effort between teaching, research and other activities in response to changes in the resource available for these activities. This means that changes in the balance of activity would not simply be reflected in changes in staff numbers.

Postgraduate research training and career development: the evidence base

43. It was noted above that one consequence of the increasing emphasis on research has been an increasing eagerness on the part of institutions to recruit postgraduates, both taught and research. There are currently 62,300 postgraduate research students in England. The pattern of growth in studentships to support these postgraduates, and the source of funding, are shown in Table 1. The major area of growth is in the number of institutionally-funded studentships. There was substantial growth after the elimination of the binary line in 1992, but this stabilised prior to the 1996 RAE, and the number has remained roughly constant since. The statistics show that this growth has occurred throughout the sector, with a similar rate of increase in both pre- and post-1992 institutions, so it is probably related, at least in part, to the funding incentives provided by the Funding Council's research funding model. An additional area of growth has been in part-time students from industry engaged in lifelong learning.

44. Information on the number of student self-funded studentships was not explicitly collected in either the 1992 or 1996 RAEs.

Table 1 Time series of the number of new studentships held in a calendar year by source of studentship (for England)

Source of studentship	1988	1989	1990	1991	1992	1993	1994	1995
Research Councils	3,434	3,674	4,328	4,046	4,116	4,184	4,265	4,497
UK Based Charities	467	510	555	634	586	630	711	684
UK Central Government	1,096	1,088	1,072	993	1,133	1,227	1,199	1,132
UK Local Authorities, Health and Hospital Authorities	343	333	283	296	294	374	404	519
UK Industry, Commerce and Public Corporations	618	771	756	926	999	991	1,093	1,183
Institutional Self Funded	n/a	n/a	n/a	n/a	2,255	3,614	3,752	4,301
Overseas	1,700	1,751	1,847	1,954	1,931	2,174	2,309	2,106
Other	895	991	1,115	1,291	470	581	488	598
TOTAL	**8,552**	**9,117**	**9,956**	**10,139**	**11,784**	**13,775**	**14,221**	**15,020**

Source: 1992 and 1996 RAE databases

Time series of estimated new PGR studentships (using student FTEs) by source of funding for each academic year (for England)

Source of studentship	1994-95	1995-96	1996-97	1997-98	1998-99
Research Councils	3,361	3,892	3,552	3,428	3,585
UK Based Charities	288	443	459	467	643
UK Central Government	1,059	1,277	1,058	915	1,092
UK Local Authorities, Health and Hospital Authorities	99	73	78	52	64
UK Industry, Commerce and Public Corporations	1,049	1,242	1,315	1,495	1,652
Institutional Self Funded	6,703	7,862	8,066	7,797	8,431
Overseas	1,522	1,506	1,607	1,303	1,339
Other	0	343	552	608	682
TOTAL	**14,081**	**16,638**	**16,686**	**16,064**	**17,489**

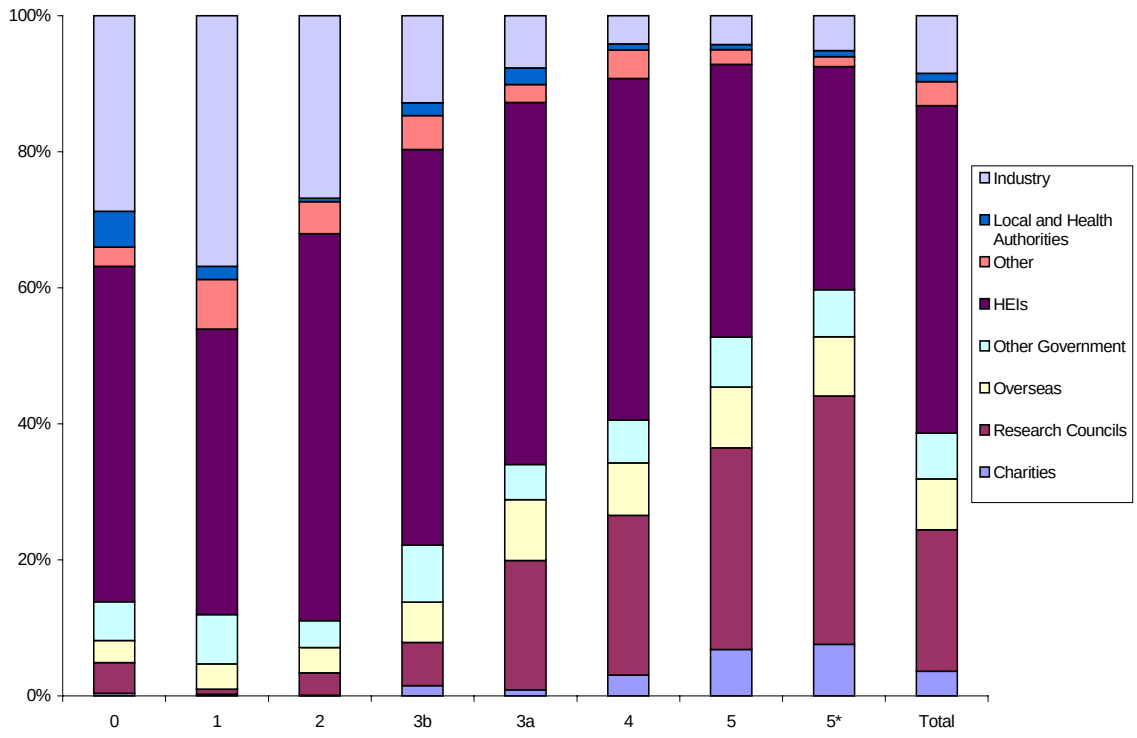
Source: HESA student record

Note: The “year of programme” field was used to estimate the number of new studentships.

45. We have seen no evidence to suggest that there are too many people embarking on postgraduate training *per se* (though the argument is different if one is considering the number of individuals that can be supported given a fixed pot of funding). We also believe that if research training is considered to be an appropriate preparation for a number of different careers, including many outside HE, the numbers are entirely appropriate, and will help to meet the increasing need of industry for well trained research-literate individuals.

46. However, there is a concern that the rapid expansion of postgraduate research activity in the sector, coupled with the determination of many institutions to develop their research profile, in some cases from a very low base, has resulted in an inappropriate dispersal of postgraduate research trainees. Some of these trainees are isolated, lack physical and intellectual support, and do not receive a level of training that prepares them for either a career in academe or outside it. This is clearly demonstrated in Figure 2 which shows a high proportion of institutionally-funded studentships in 2, 3b and 3a rated departments, which are departments that do not necessarily provide any exposure to research of international quality.

Figure 2: Source of funding for studentships by RAE rating (1998-99)



47. Figure 3 shows the distribution all those registered as a research student against RAE rating. Figure 4 shows the distribution of all those on a postdoctoral research assistant contract against RAE rating. Again, it is clear that there are substantial numbers of researchers in lowly rated departments. We note that responses to the Call for Evidence shared our concerns about the quality of research training, and showed widespread support for a move towards greater concentration of research training. Our aim is to balance the legitimate aspirations of institutions to develop their research capability with the rights of students to receive appropriate research training.

Figure 3: Postgraduate research students (FTEs) by RAE Grade (1998-99)

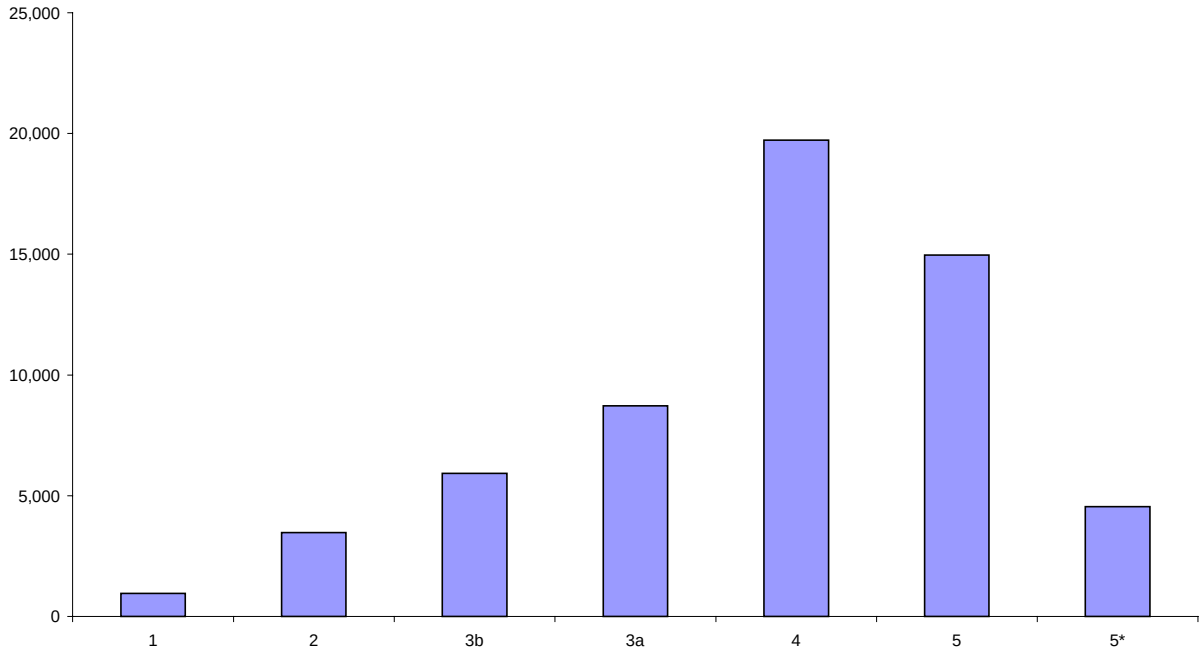
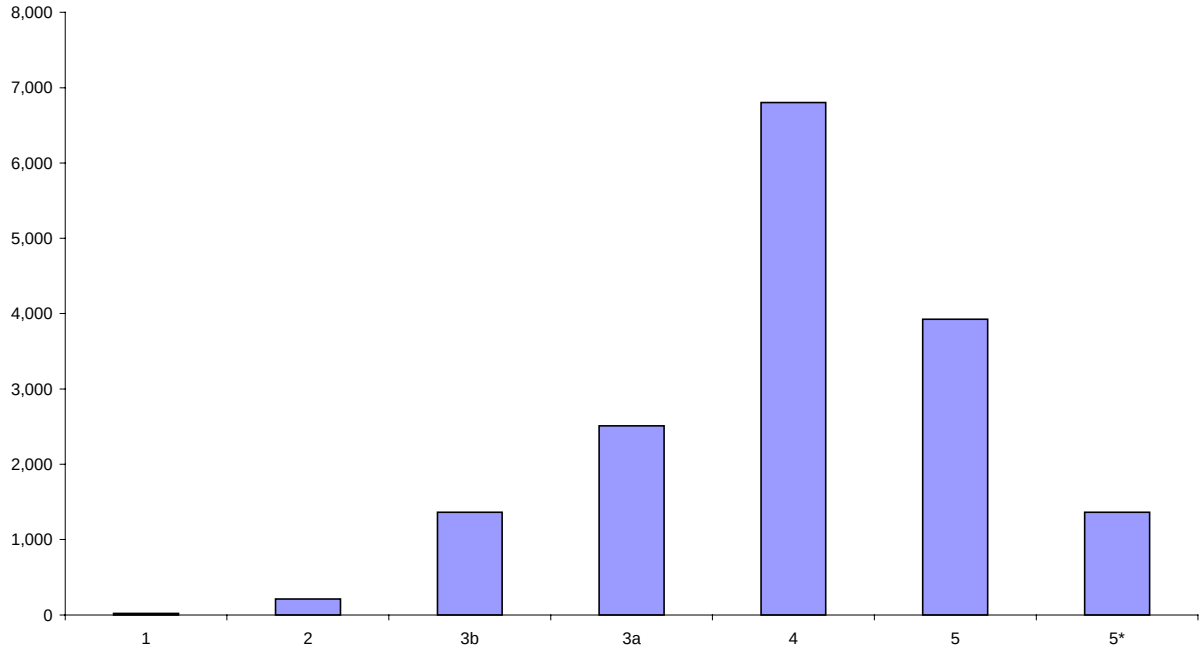


Figure 4: Postdoctoral research associates (FTEs) by RAE Grade (1998-99)



Postgraduate research training and career development: proposals for enhancement

48. As discussed above, institutions are, and ought to be, free to develop their research activity in accordance with their own missions. Postgraduate activity is one of the legitimate tools they use to do this. Postgraduates help to develop the research culture of a department at the same time as they contribute materially to the delivery of research programmes. However, we are concerned whether the legitimate support expectations of postgraduate research students can be met in environments characterised by isolated researchers. Even where the supervising individuals are excellent, we are concerned about the general infrastructure support for students and how continuity of support can be established where support is so closely tied to an individual supervisor. The issues would seem to us to be as follows:

a. Increasingly the range of research skills and experiences students require cannot be supplied by a single thesis supervisor; this holds just as much in the arts and humanities as in the sciences.

b. There are significant economies of scale in the delivery of research training, particularly the generic skills acquired early in the training experience.

c. Increasingly, globalisation requires that students' training experiences should expose them to world class facilities and world class researchers.

d. There is an increasing need to teach supervisory skills, and this may be facilitated by collaboration.

49. We have therefore devoted considerable attention to considering what mechanisms and structures could be developed to enhance the development of research people.

50. We recognise that there will not be a 'one size fits all' solution – some mechanisms may need to be discipline based, others regionally based.

51. We talk of 'research people' because the mechanisms by which research training and career development could be enhanced would not just be appropriate for research students, but would also meet the needs of postdoctoral researchers, relevant areas of continuing professional development (CPD), and mid-career conversions from practice to research.

52. We are also concerned about the career development of new academic staff. Interviews undertaken at departmental level by the consultants, and feedback from the young researchers' workshops, demonstrated a wide variety of institutional practice in this area. The best institutions had effective policies for mentoring new staff, but in other departments new staff were given little or no remission from teaching and administrative activities, and little or no support to establish their research. Often they were obliged to develop new courses and to learn how to integrate the duties of academic staff without assistance.

53. We have considered a range of options, some of which have greater implications than others. We recognise that the acceptability of any proposals will have a profound effect on the success with which any scheme could be implemented. The question of quality assurance is key, and we recognise that

any development must be linked to the quality assurance methods of the Funding Councils, Research Councils and relevant professional bodies. We also note that if the quality of activity was poor under these new arrangements, a lack of ownership might tempt institutions to pull out of the arrangement, rather than remain inside it and attempt to deliver the required improvements.

54. It is not the HEFCE's role to determine whether or not institutions choose to deliver postgraduate training. However, it is right for the HEFCE to consider whether it should be funding provision that does not meet agreed minimum standards.

55. We acknowledge the need to consider a market-driven view alongside the provider-driven view - to take into account what individual postgraduates are looking for, and how any proposed models will help to deliver this. We recognise in particular that the requirements of full-time and part-time students might differ. We also recognise that developing successful approaches, which will probably involve collaboration between institutions, may have implications for a much wider range of activities and, in particular, other forms of inter-institutional collaboration.

56. In addition, we note that research training needs to be sensitive to the different role that the PhD qualification plays in different disciplinary cultures. This means that there is a need not only for a critical mass of postgraduate researchers to support the development of generic research training, but also a critical mass within disciplines (or broad groups of cognate disciplines) to support networks between the individuals that can provide social support and intellectual stimulation.

57. We have considered five models, which have been tested against the following criteria:

a. While focused on postgraduate researchers, the model must assist young researchers up to, and including, their first established post.

b. It must be sensitive to the different research training cultures and career progression pathways in different disciplines.

c. The model must avoid reinforcing disciplinary categories too firmly.

d. It must facilitate the concentration of training activities, in order to achieve critical mass.

e. The model must impact on institutional practice, providing opportunities and incentives for best practice to be shared.

f. The effects of the model on 'barriers to entry' to PGR provision must be considered, because of potential knock-on effects on selectivity.

58. Four of the models are discussed in the paragraphs below and the fifth, the Scotdoc model, being somewhat different as an existing formal collaborative mechanism developed to support research training in the UK, is discussed in the section beginning at paragraph 95.

Learning and Teaching Support Network (LTSN)

59. It would be relatively cheap and simple to expand the responsibilities of the LTSN. There is obvious merit, if possible, in using an existing initiative rather than developing a new one. The network is currently funded to the level of £6.2 million per year over three years; additional costs would probably be small. The centres are a powerful tool for spreading best practice through disciplinary networks, but they are not currently equipped or designed to provide facilities for collaborative research training. The LTSN has a formal structure of 24 subject centres, which would be less appropriate for research, and there would be a considerable risk of loss of focus – both for research trainees and for the subject centres. There are no obvious mechanisms for centres to assist postdoctoral staff, or even students in the later stages of PhD work who have finished the formal training element, usually confined to the first year.

Integrative Graduate Education and Research Training (IGERT) programme

60. The IGERT programme has been run for a number of years by the National Science Foundation (NSF) in the USA. It seeks to integrate researcher development with the development of multidisciplinary research fields, and to foster collaboration. The integration of researcher development with the research programme itself is a strength of this model. It is likely that the good practice developed will remain in the institution, to be embedded in future research programmes funded through other routes.

61. However, the number of five-year research programmes funded through IGERT is necessarily limited. Also, it is debatable how successful this approach would be in developing and embedding improved research training in large and research-intensive institutions with considerable autonomy at the departmental level. In addition, it is not clear how the model would assist the establishment of collaborative arrangements to deliver postgraduate research training

62. The IGERT model is well placed to assist the development of researchers at all levels in the sciences, where it is the normal expectation that PhD students and postdoctoral researchers will develop their skills working in the research groups of more senior scientists. Also, any effects on 'barriers to entry' for PGR provision would be minimal. However, there might be greater difficulty in implementing this model in the arts, humanities and social sciences..

63. Although an interesting proposal, the IGERT model, with its focus on funding in association with specific research programmes, would be more appropriate in a UK context for the Research Councils or other project funders to employ – to augment their current practices - rather than as a mechanism for HEFCE to support a general enhancement of research training.

Research training support networks

64. Most of the examples of mechanisms that have been developed to enhance research training, detailed in the reports we have received from our consultants, are of collaborative arrangements for specific disciplines.

65. These vary from the comparatively formal arrangements of the Scottish doctoral programme in economics, to less structured collaborative arrangements such as Wessex Geography and North-West Psychology. Formal collaborations can be time-consuming to construct and maintain, whilst less formal schemes may lack the administrative continuity generally required to have meaningful impact on institutional practice. Therefore, we have developed an intermediate option, with features of both less and more formal disciplinary collaborations - Research Training Support Networks (RTSNs). This model draws heavily on work that has been undertaken by the UK Council for Graduate Education.

66. The RTSN model would involve the HEFCE facilitating the establishment of networks to support the delivery of collaborative research training by providing access to skills of supervisors across the partner institutions; identifying and filling gaps in the ability to provide training; and bringing supervisors and students together from across the network. This would ensure a systematic approach to the development of research skills and provision of research training across the network. The RTSNs would also provide opportunities for the dissemination of good practice, and a forum for intellectual interaction between, and social support of, research trainees.

Summer schools are the most common current expression of fora to support research trainees. However, it would be perfectly possible for RTSNs to meet more often, perhaps even weekly where appropriate, or for them to develop other mechanisms to support intellectual and social interaction.

67. The key to making this approach work would be to place minimal constraints on the kinds of collaboration and types of activities that were developed, so as to reduce the risk of facilitating collaboration or other activities for their own sake. Additional funding might be required, perhaps on a five-year rolling basis, though funding would also be provided under the core funding model driven by a link to the RAE.

68. Each network should be large enough to provide critical mass - which will permit the delivery of focused, efficient and effective training for generic skills acquisition in the first-year - but small enough to be able to meet effectively the needs of research trainees to develop specific skills. We would expect to see a typical network include an academic director; for it provide administrative assistance and literature; to engage in web development of training support aids; and to bring researchers together - at summer schools or at other events. We consider that the training itself would largely be delivered by the members of the network and therefore would not be paid for additionally.

69. A lead department would have to be identified, and it would be necessary for this institution to provide reassurance that its core research training was of a high calibre. As a separate evaluation of research training does not yet exist, high RAE scores would be one possible proxy for this in the beginning. However, even requiring a minimum of a 4 rating would create difficulties in some disciplines where there are few such centres. Such a criterion might therefore have to be interpreted flexibly.

70. The nature of the relationship between the lead and other departments might differ markedly in any given network. Potentially both ‘hub-and-spoke’ and ‘rim’ models of collaboration might be funded in this way.

71. We believe it would be best to specify a maximum number of networks which an institution could lead. This would encourage institutions to seek to lead only those networks that were key to their strategy, and would ensure that all institutions with significant levels of postgraduate activity would be able play a leading role in developing some networks. This could be important in ensuring that wise-spread institutional good practice was developed, since an institution without a network centre might otherwise only be exposed indirectly to good practice.

72. We consider that active researchers are best placed to define the populations of postgraduate, postdoctoral and other junior research workers who might benefit from collaborative research mechanisms. Perceptions of common purpose and interests would probably frequently involve regional disciplinary groupings, but might not necessarily do so. In some disciplines the number of researchers in a region might be too small to support a network: in such a case a national network might be preferred, or participation in a more broadly-drawn regional network. In other areas, such as medicine, disciplines might need to be broken down into sub-disciplinary networks or multidisciplinary problem-based networks. RTSNs would also benefit from close links to users and potential employers of trained researchers outside the HE sector.

73. There are currently some 40,000 full-time (FT) and 20,000 part-time (PT) postgraduate research students, with considerable variation in the balance between the numbers of each depending on the discipline. It might be expected that PT students would make fewer demands on research training networks than FT students - many PT students will be established in careers and undertaking research for personal development reasons - but this does not mean that they should get a lower level of support. We also consider it vital that these networks are open to non-traditional routes of entry to the research career, including conversion from practice in mid-career.

74. We have mapped the numbers of full- and part-time PGR students in each discipline, in each region (Annex C). This mapping provides some indication of the pattern of provision which might be needed. For instance the medical UoAs (1, 2 and 3) in the London region account for over 1,200 FT and nearly 1,000 PT PGRs. It is difficult to see the needs of this mass of postgraduates being met by a single network, or even by three separate networks. The East Midlands, however, has 107 FT and 315 PT postgraduates in these three UoAs, which suggests a single network might be appropriate. UoA 48 (European studies) records about 120 FT and 120 PT PGRs in all English regions combined, which suggests either a national network or incorporation into wider multidisciplinary networks would be most appropriate.

We might distinguish a broad group of disciplines (medicine, physics, chemistry, psychology, biological sciences, materials, business and management, english, history, education, and perhaps geography) where a network might be needed in every region to meet the needs of the large numbers of PGRs involved. Engineering would a need more than one network in each region, but it may not be appropriate simply to construct networks that mirror the engineering UoAs. In other subjects (nursing, veterinary science, accountancy, celtic studies, italian, russian, library and information management) the considerably lower numbers of PGRs suggest that either a single national network or a joint regional network with a cognate area would be most appropriate.

75. We realise that institutions with strong PGR provision might see little benefit in joining such collaborations and, because of the potentially complex and interlocking nature of the structures that might be established on such an open basis, it would be difficult to ensure that all PGRs were, or could be, members of a network. However, if explicit assessment of research training took place it would not be necessary to ensure that all PGRs were part of a network, as institutions would simply be required to demonstrate adequate provision through the assessment process – with or without accessing facilities made available through collaborative networks. If a separate assessment process were not in place, this might strengthen the case for specifying the disciplinary and regional basis of the networks to be funded in order to ensure that all institutions and PGRs were appropriately included in a network.

76. It will also be necessary to consider:

- how to address the possible loss of students from partner institutions to hosts of the research training support network
- the need to avoid 'unnatural' collaborations developing
- how to meet, and manage, the administrative burden.

Collaborative graduate schools

77. Collaboration on a hub-and spoke basis could be expected to concentrate research students for the purposes of research training, networking, social interaction and exposure to the best possible research environment, without limiting the ability of the spoke institutions to develop their research base. A hub-and-spoke model provides the obvious advantage of reducing the number of collaborative entities to be funded, and spreads the accumulated organisational knowledge and best practice represented by the existing graduate schools.

78. A key concern, if such an approach were implemented, would be to ensure that the recognition of the partnerships by the HEFCE is integrated with the recognition methodologies of the appropriate Research Councils. Criteria would probably include evidence of critical mass for the provision of research training and generic skills acquisition; evidence of access to high quality research infrastructure, mentoring and support of research training by staff engaged in research at an international level; and evidence that the postgraduate experience was widened and enriched by the partnership between institutions. This would imply a link to units rated 4 and above in the RAE (that is, showing some evidence of international quality) in those disciplines in which the partnership was active. The link would probably need to be strongest in the first year, when training is most intensive, but would probably still be present in the later years of PhD study, even if the supervisor is in a less highly-rated department. The link to the international research culture of a highly-rated department might also be of benefit to staff, who would be able to enrich their own research through these augmented mechanisms to exchange ideas.

79. It might be necessary to make additional funding available as part of the recognition process, to meet additional costs, where there was clear evidence of enhancement of the student experience. Conversely, it might be considered necessary for HEFCE funding for postgraduate researchers to be

withdrawn from those institutions which were not members of a recognised partnership covering the appropriate disciplines, if they failed to demonstrate appropriate alternative arrangements to enhance research training.

80. It might be argued that such an intervention in the provision that institutions make for their postgraduate research students infringes institutional autonomy. We accept the importance of institutional autonomy, but consider that it needs to be balanced against the rights of the student. Substantial funds are provided ostensibly to support postgraduate research students, and reasonable steps must be taken to ensure that those funds secure a proper level of support for the students in question.

81. Where infrastructure to deliver research training is already in place and integration of good practice well developed, the collaborative graduate school model would be extremely effective and would , through hubs-and-spokes, be able to encompass all institutions. However, institutions have shown reluctance in the past to enter into collaborations with partners who are not seen as equals and this proposal might run a risk of funding artificial and ultimately unworkable collaborations.

82. We summarise the essential components of the five options in Table 2.

Table 2 Options for developing enhanced research training and career development

Method	Advantages	Disadvantages
Add responsibility for PGR training to the remit of the Learning and Teaching Support Network (LTSN)	Disciplinary basis. Makes use of existing networks and integrates PGR training with advances in L&T generally. Does not divide research from L&T or undergraduates from postgraduates - will tend to be the same academic staff in institutions who teach and supervise all three groups.	LTSN already has ambitious remit. Centres have been established without PGR work among their aims. Does not address the question of research careers more broadly
Programme modelled on the Integrative Graduate Education and Research Training (IGERT) Programme of the NSF	Model already in use in the USA. Integrates researcher development with the development of multidisciplinary research fields. Fosters collaboration both between and within institutions	Creates a new initiative. The model seems more appropriate to Research Council than Funding Council use. Funding is awarded for up to five years, but because it is associated with a particular research programme, improved practice may not become embedded in the institution
Create new subject centres on the model of the existing LTSN – research training support network (RTSN)	Disciplinary basis. Creates new centres focused on the specific goals of PGR and researcher development	Creates new initiative. But model is proven and allows institutions to identify and implement the most appropriate arrangements to enhance the research training experience
Direct collaborations between similar departments (the Scotdoc model)	Disciplinary and regional basis makes for strong links. Local management based on academic and institutional autonomy rather than a centrally-directed programme.	A diverse web of collaborative arrangements would be needed. Difficult to ensure that all were well managed and effective, also difficult to ensure that all PGRs were included in such schemes. Not clear how well such arrangements would work if the partners were seen as unequal. Unclear what level of additional financial support is required
Create collaborative graduate schools through funding constraints and incentives (hub-and-spoke model)	Creates clear hub-and-spoke models and economies of scale. Synergy from breadth and depth of environment will definitely enhance student experience. Eliminates students' sense of isolation. Critical mass creates basis for infrastructural investment in student support facilities	Clustering will always exclude some specialised sources of supervisory input. Lone scholar tradition still strong in some disciplines. There may be sectoral consequences depending on how it is implemented. Unclear to what extent these entities could be truly 'collaborative'. May be difficult for part-time students to access

83. We recommend that the last three of these options could be employed as mechanisms to improve research training and career development. They are summarised below, with some proposals on how they might be implemented, to facilitate comparison of the pros and cons.

Research training support networks (informal collaborative model)

84. Research training support networks (RTSNs) are not formal collaborative graduate schools, although they might easily develop into such if participating institutions wished it.

85. They would probably be consortia of three to six departments, probably geographically close to one another and submitting to the same UoA, though other configurations could work. Consortia would be informal and self-selecting, and would specify their own approach to research training in response to the HEFCE's generic requirements for improved training and development (that is, supporting academic networking, dissemination of best practice, implementation of a systematic approach to training and professional development).

86. As with the LTSN, such a model might involve the HEFCE seeking bids to meet the additional costs of establishing the network. RTSNs might require a director, probably at professorial grade. There would be contributions from participating departments and professional trainers.

87. Research training might involve established approaches (summer schools, seminars and training events held at one of more of the host departments), and/or something more innovative, such as action learning or IT-mediated delivery.

88. Lead departments, who would hold and control any funds allocated for the support of the network, might be required to meet an objective minimum quality threshold. Joint leadership of networks could be permitted although this might complicate the recognition process.

89. Institutions would 'opt in' to this system, but the improvement in research training outputs would primarily be assessed as part of the RAE, which could provide a cost-effective way of ensuring institutions met the required minimum standards

Collaborative graduate schools (formal collaborative model))

90. This would be a much more formalised approach, probably involving joint recognition by the Research Councils and the HEFCE of the quality of provision to ensure that justifies funding. Recognition would include arrangements for research training, but also generic skills development.

91. In order for the entity to be recognised it would probably need to be in receipt of Research Council studentships and/or include a significant component of research activity with an RAE rating of at least 4 (quality that equates to attainable levels of national excellence in virtually all of the research activity submitted, showing some evidence of international excellence). Recognition criteria would also probably require:

- evidence of critical mass, for provision of both research training and generic skills acquisition
- evidence of access to high quality research infrastructure
- mentoring and/or significant support of research training throughout the period by staff engaged in research at an international level
- evidence of enriching and widening the postgraduate experience
- evidence of good completion rates
- provision of formal training in necessary areas.

92. Also a significant period of the first year of training should involve exposure to a research environment rated 4 or above.

93. There should be some exposure to a research environment rated 4 or above in the second and third years of research training.

94. HEFCE resources would be needed to meet additional costs on a per capita basis, where enhancement is demonstrated. There could be a competitive bidding exercise to fund infrastructure costs of significant postgraduate growth (through the existing Collaboration and Restructuring Fund).

The Scotdoc model (semi-formal collaborative model)

95. The Scotdoc programme was established in 1989 to address the perceived lack of strength in depth in Scottish economics. The eight participating departments have agreed not to accept PhD students who have not completed a one-year collaboratively organised MSc sited at one of the institutions. Although all teaching takes place at this university, all the departments contribute to the programme. Students taking the MSc can register at any of the institutions.

96. The management of the programme is delegated to an executive committee of six members. The committee receives external examiners' reports, acts on quality assurance issues, and deals with funding and marketing issues. The running of the programme is entrusted to three directors.

97. The university at which all the teaching takes place receives the fee income and keeps a record of programme expenditure. At the end of the year a surplus is calculated and distributed between the partners. The scheme is generally seen to have the following benefits:

- enables the strongest members of staff to participate in PG training across the network
- addresses the lack of critical mass in small and dispersed departments
- ensures a supply of PhD students with a guaranteed level of initial postgraduate education
- establishes, through collaboration, minimum standards throughout the network
- improves networking opportunities
- improves recruitment and retention of economists in Scotland
- provides a better student experience
- improvement in the research ratings of partners.

98. There is a recognition that one of the key foundations of the Scotdoc programme is equivalence between the parties, and this may be undermined if differential performance develops over time.

Conclusion

99. We believe that these three options, as currently conceived or in combination across the sector, provide a new and potentially extremely effective framework for the future development of research training. We believe that there is some benefit in allowing institutions to choose which approach is best for them, given their particular circumstances. It would then be the HEFCE's role to establish minimum criteria and assess the outcome of the provision against these criteria. Such a process would need to be related to the RAE, but could be separate from it.

100. To an extent, RAE panels already consider research training as part of their overall assessment. The information provided in the textual commentary within submissions (form RA5) is the primary source of information for this purpose. HEIs are invited to describe, *inter alia*, the staffing policies in place to support research development. They also describe their research infrastructure, culture and environment. Information on research assistant numbers is collected for each member of research active staff returned (form RA1), and numbers of research students, studentships and degrees awarded are given in form RA3. Some panels give considerable weight to the textual information but most place primary emphasis on the publications and other research outputs listed.

101. The present RAE requirements do therefore give some basis on which to assess research training, but it is doubtful if there is sufficient information on which to make a full and robust assessment. There is also an issue about the extent to which the information given in RA5 is capable of verification and audit. A more fully developed and closely specified set of information requirements would probably be necessary. The precise content and nature of those requirements would, of course, depend on the nature of the assessment envisaged.

102. In fact, there would be considerable advantages if the assessment included some individuals who had been members of RAE panels, but also included representatives from the Research Councils, and charitable and industrial funders of research training. Such an approach would need to reflect disciplinary differences, but probably not to the same extent as the RAE. It may therefore be possible to accomplish such an assessment with as few as five panels, one for each of the main cognate areas: medicine, physical sciences, life sciences, social sciences, and arts and humanities.

Section 2: How best to promote research activity synergistically with the promotion of high quality teaching and interaction with business and the community.

103. The agenda for higher education has changed. HEIs are central to society's attempt to address issues of profound economic and social importance, many of which have a significant regional dimension. This shift from a conception of the university as an 'ivory tower' to one of universities and colleges taking an important and, in some cases, central role in delivering key public policy objectives is one of the most important underlying trends of recent years.

104. The change from an elite to a mass system of higher education has accompanied this shift in public policy. Higher education is no longer funded publicly just as an end in itself; it is also funded for more functional, even utilitarian, purposes. In other words, higher education is in part a means rather than an end. The expansion of public funding has taken place partly on the basis of promoting societal, and not individual, values. HEIs have therefore been given a mission which is partly set by those outside higher education. Research and the pursuit of knowledge for its own sake may often have important consequences for commercial users of research, but the new agenda engages higher education research in much more than this. It also embraces research relevant to policy and technical problems, research which underpins service delivery in both the public and private sectors, in knowledge transfer and consultancy. Thus the delivery of improved economic competitiveness has quite profound implications for the structure and function of HEIs.

105. We believe that placing HEIs at the heart of this new agenda is not only entirely appropriate but overdue. They have a highly trained and flexible workforce and have demonstrated that they can effectively engage with real-life problems and the changing nature of traditional activities. This will be enhanced by greater clarity and complementarity in the purposes for which funders provide support. However, we believe that institutional autonomy is the key to the willingness and effectiveness with which institutions can engage with this agenda, and optimise the complex and inter-related activities they host.

106. The increasing democratisation of research is recognised, and welcomed. However, we note that there could be unforeseen and possibly unwelcome consequences for research if its nature and purpose were determined too rigidly by political agendas. For instance, research might involve some practices – such as animal experimentation – which, though entirely legitimate and essential to enable research to enhance the health of the nation, could cause ministers to come under pressure from lobby groups who seek to have such activities banned, or severely restricted.

Section 3: How to ensure that institutions can develop excellent research and engage with the regional agenda

107. All regions present academics with research opportunities, either because organisations in a region sponsor or collaborate in research activity, or because regional social, economic or other factors may themselves form a topic for research.

108. We do not believe that there is a dichotomy between research of international quality and regional relevance, nor that there is any inherent conflict between developing excellent research and engaging with the regional agenda. However, we feel that there are dangers that research can become parochial and inward looking if it is not linked to the wider research effort. In addition, excessive focus on incremental regional research may mean that transformational national or global developments are not embraced. The consultancy study we commissioned confirmed that researchers do not see regional links as sufficient to sustain leading-edge research capability on their own.

109. Global companies can go wherever they wish to find the research they need: it is international excellence a region needs to attract such companies. Smaller technology-based companies also locate themselves where there is a research base of international excellence, or are 'spun off' by institutions on the basis of excellent research. Evidence collected for us by HEPU on collaboration between HEIs and user communities demonstrates that institutions also recognise that interaction with local and regional users makes a vital contribution to their own mission. This is not merely because industrial or commercial users have access to resources which can support fundamental research to international levels of excellence, but also because a balanced portfolio of fundamental and applied research is recognised as a necessary goal in itself. It sets up two-way flows of information, people and skills to the benefit of researchers as well as users.

110. Thus for global companies, who have the resources and knowledge to seek out the best research wherever it is found, in the UK or abroad, and those who seek out the best research in the UK, the regional agenda and the drive to develop research of international quality are the same.

111. However, there are also user communities for whom locality is much more important. Companies without a history of engagement with the HE sector need to be able to commission research of relevance to their needs from a local institution without being forced to navigate the complex landscape of research in UK higher education. Local government and NHS Trusts also need to be able to commission research relevant to local service delivery. This research must be good enough to meet the purposes of the users. In addition, we recognise that there are subjects that are regionally based – such as health care delivery.

112. We must have a concern for the accessibility of internationally excellent research to sophisticated users. But we must also have a concern for the excellence of the research which is accessible to users with narrower horizons or less experience of interaction with the HE sector, who are less able to identify and access the best research or whose problems may not be demanding enough to engage the attention of the best researchers.

113. Health-related or educational research are examples of research fields where the region provides a test-bed for research ideas. There are other instances where the locality provides a test-bed to explore international issues. Such research could, in principle, be undertaken anywhere but proximity is important and regional considerations do in practice make a considerable difference.

114. We commissioned a study of regionality from Segal Quince Wicksteed which suggests that many HEIs recognise their importance to the region, but this is not always incorporated into research strategies because:

a. The regional impacts of HEIs relate primarily to activities other than research: training is probably more important. The findings suggest that geographical proximity is useful but not of key importance where leading-edge research is sought. Large companies put a premium on research quality and the ability to meet business requirements rather than proximity. Proximity is more important where the activity is developmental rather than research orientated and the sponsors tend to be small and medium enterprises. These activities, however, tend not to lead to traditional academic outputs.

b. Many consider that the regional impacts of their research will be maximised through an outward looking (national and global) approach rather than an inward focus on the region.

c. Whatever the regional benefits might be, research has to generate revenue and regional sources are very limited.

115. As the report from SQW demonstrated, a number of models exist which illustrate that the concept of 'regionality' can sustain an HE sector that demonstrates both healthy competition and fruitful collaboration.

116. The justification for public spending on research differs between disciplines. In the case of professions – particularly health-related professions but also teaching and others – there is a need for research at a regional level to underpin training and service delivery. Nursing and professions allied to medicine have seen a sharp rise in volume of research in the RAE, but quality overall remains low. We noted the selectivity sub-group's view that the review should consider separately how to support the peaks of research excellence and to maintain the distribution of good quality research throughout the UK.

117. We believe that institutional autonomy is key to the responsiveness of HEIs to users and stakeholders, whether regionally or internationally focused. Institutions are best placed to identify the user groups with whom they need to work, and best placed to evolve the structures they need to collaborate with those users. Evidence from the study undertaken by HEPU of institutional policies towards collaboration, as well as from the study by SQW of regionality, confirms that institutions are actively seeking partnership with users at local, regional, national and international levels.

118. Unfortunately, there is currently very little regionally based public research funding to catalyse more interaction between HEIs and their region. The only significant source is that provided through EU structural funds, of which the European Regional Development Funds (ERDF) are the most important,

but their relevance to research is limited. We are also concerned that the response of institutions and academic groups to new needs and opportunities may sometimes be too slow. Users can catalyse innovation by making new demands on researchers, and often have the resources to make innovation possible. But where the relevant stakeholders are national professional or practitioner groups, particularly in public sector professions, they are unable to commission research directly because they lack either the funds or the mechanisms to do so. There are also obstacles to institutions seeking to invest in emerging areas. Smaller institutions might find it particularly difficult to develop their research portfolio because of the smaller resource base to generate investment. In addition, efficiency gains in public funding are making it harder for all institutions to innovate. We are also concerned whether the human resource management of institutions allows staff sufficient freedom to develop research in emerging areas.

119. We therefore believe that additional support is required to facilitate capability building in institutions, in order to meet the new needs and opportunities that emerge from their interaction with local, regional and national stakeholders. However, where the case for investment to create or support research capacity is simply for regional development reasons, we believe this should be funded from regional development funds. To fund only for the purposes of regional capability building through the national science budget risks undermining the national capability.

120. We have considered the implications of national assessment and funding systems for regional activity and international collaborations. As we note above, it is important that research in some disciplines is maintained on a regional basis. However, we believe that a national assessment process is essential to provide an appropriate benchmark. There should be measures to develop regional capability where there is a clear need, but this should be transitional rather than permanent. This activity should become self-sustaining – funded either by project funders on a collaborative basis or by users.

Capability building

121. We note that the nature and purpose sub-group will be reconsidering whether a policy factor should be introduced into the HEFCE research funding model. We are sceptical about the appropriateness and robustness any mechanism for defining ‘national needs’, which are often expressed in terms of traditional subjects where undergraduate intake is declining, whereas 70 per cent of the UK economy is made up of service industries, most of which lack a research base.

122. Also, it is often the case that there is a significant need not for world class research but for high quality research relevant to local, regional or national needs, in areas such as social work, law, and accountancy. We recognise that where the relevant stakeholders are a national professional or practitioner group, particularly in public sector professions, they are often unable to commission research because they lack the funds or mechanisms to do so.

123. We have heard about a number of areas that would not have developed without specific funding, because of 'market failure', and we do not believe that the need for such funding has reduced. Rather,

we believe there is a case to develop a funding stream to build capability where there has been a research 'market failure'.

124. The process of capability building may be broken down into five stages:

- identifying the need for capability building
- assigning responsibility among stakeholders
- identifying what measures to take
- implementation
- assessment of success and the decision to terminate or continue capability building.

Identifying the need

125. Currently the HEFCE has no system to identify strategic areas in need of capability building, although it responds ad hoc to requests from stakeholders to become involved in capability building. The systems in place among other stakeholders to identify and fund areas in need of capability building vary.

Assigning responsibility

126. Higher education has many stakeholders, and funding for research is characterised by multiple streams of funding. This is generally recognised as a valuable feature of the UK research funding system, but it creates potential difficulties in negotiating and assigning responsibilities for capability building. Clearly if diverse stakeholders fail to co-ordinate their activities it is likely that capability building activities will not prove successful. Agreement among stakeholders can also be difficult in terms of defining success, and many professional groups have not yet evolved the structures for integrating research with practice.

Identifying measures to take

127. Capability building measures generally take three basic forms:

- development of methodologies and conceptual bases for further research
- development of the skills of the research workforce
- provision of appropriate physical infrastructure such as libraries, laboratories and equipment.

128. The emphasis on each of these components may vary between stakeholders and disciplines. In the case of interdisciplinary areas, the development of methodologies and physical infrastructure are likely to be less important. Here the key may be the creation of ring-fenced funding to promote interest from researchers and to protect them from the inherent conservatism of peer review. Capability building

measures may be reasonably short term in these cases since skilled researchers will be attracted into the area and can be expected to attract research funds after they have established themselves.

129. Measures for the development of research skills may include the funding of research fellowships and studentships, or the attraction of key individuals from overseas to import skills which are not available in the UK. Skills in application writing and project development can also be fostered, for instance through enhanced feedback on applications, although this can be very labour-intensive for assessors and administrators. Most important is to ensure that there is a coherent career structure in place which will allow researchers to develop their skills alongside any clinical, professional or teaching commitments, at all stages from postgraduate through postdoctoral to professorial level. The skills of support staff such as technicians are to some extent a different matter, but there is the same concern to ensure that there is a coherent career structure which is sufficiently attractive to encourage them to remain in research.

Implementation

130. Capability building can be very human resource-intensive both for funders and the funded. The HEFCE currently lacks the organisational resources to engage in directed support of substantial capability building. The implementation process also implies monitoring to ensure that milestones are being met.

Assessment of success

131. Success would be defined as a research area or discipline being able to compete with established areas for sustainable levels of funding – either for collaborative research or contracted research. The agreement of goals requires careful negotiation with stakeholders; failure to agree clear success criteria can create difficulties when the programme is evaluated and a decision has to be made whether or not to commit further funds. In some emerging disciplines, such as nursing and quantitative social science, the needs of local and regional users for research relevant to policy or practice may be particularly important.

The role of institutions

132. We believe that institutional autonomy is key to the ability of the sector to respond to the demands of stakeholders, and clearly the development of new research areas is a feature of this response. The findings of the PREST survey of institutional allocation systems, undertaken to inform this review, demonstrate that institutions tend to follow HEFCE allocations very closely in their own internal allocation procedures. This raises the question of whether HEFCE funding policies do enough to preserve the freedom of institutional managers to invest in new areas. We therefore welcome the suggestion of the nature and purpose sub-group that a separate funding stream is introduced to support the development of strategically important emerging areas.

Section 4: Can collaboration facilitate the different missions of HEIs?

133. The Call for Evidence demonstrated that support for collaboration is widespread in the sector. The findings from the HEPU study have confirmed that collaboration is the rule and not the exception.

134. HEPU have provisionally identified two models of collaboration in the delivery of postgraduate training: strategic partnerships and executive partnerships. Strategic partnerships are informal, with institutions retaining control of the activity at the local level; executive partnerships are more formal, with collaborative arrangements for the delivery of the whole training programme agreed by the partners.

135. These collaborations are often disciplinary: it can be easier to develop collaborations between the same disciplines in different institutions than between different disciplines in the same institution. This can sometimes result in tension with the more formal approach to constructing collaborations taken at an institutional level. Much inter-institutional collaboration is driven by the need for institutions to deal with third parties, such as the EU. However, alongside the day-to-day collaboration of individual academics and research groups, which are the bedrock of research activity, successful partnerships and collaborations between institutions and between institutions and their stakeholders are being built up. We believe the evidence shows conclusively that the level of collaboration in the sector is healthy. The views sometimes expressed that collaboration is being impeded by the HEFCE's policies reflect the importance of collaborative working in the sector rather than real evidence of barriers to collaboration.

136. Collaboration can be a means of achieving critical mass or economies of scale. The need for critical mass appears to be increasing in some disciplines, driven by a rise in the sophistication of scientific equipment, and decreasing in others, as a result of advances in IT. Institutions are best able to determine whether they need to take steps to achieve critical mass in a research area, and whether to expand their investment on their own or seek collaboration in order to achieve it.

137. The consultants explored the basis for collaboration between more research-intensive and less research-intensive institutions. Their findings suggest that more research-intensive institutions generally see little to gain in collaborating with less research-intensive institutions, while the latter are reluctant to enter partnerships on an unequal footing.

138. The promotion of collaboration has implications for institutional autonomy and governance. In particular, the direct funding of research groups rather than institutions might create uncertainties about who is, or could be, accountable for the use of public funds allocated to such groups. The consultants found little enthusiasm for the direct funding of collaborative research activity by HEFCE, and we agree that there is no case for promoting collaborative research within the UK HE system as an end in itself. However, we do consider that explicit measures are required to promote collaboration in the provision of research training. We recognise that, though not without its problems, EU funding does promote international collaboration, and we would welcome UK measures to promote and support international collaboration.

Section 5: How to maximise the benefits of complementary funding by the HEFCE of teaching, research and work with business and the community

135. The intention of current policies is to support diversity, but there is a concern that in practice, as all institutions compete for all types of income, convergence is being promoted rather than diversity.

136. As we note above, the promotion of high quality research should not be assumed to pull organisations away from the promotion of high quality teaching, interaction with business and the community, or engaging with the regional agenda. Competing to undertake the highest quality research in a global research effort has benefits for these other activities, and provides a bulwark against any tendency to parochialism within institutions or regions.

137. We consider that it might be appropriate in future for grants from the HEFCE's Reach-out to Business and Community Fund (HEROBC) to fund some activities currently supported by QR funding. However, we would be concerned if the development of HEROBC entailed a parallel assessment process being established alongside the RAE, making similar administrative demands on institutions. However, a more sophisticated approach to the distribution of HEROBC funding is undoubtedly warranted. We note in particular that some lower rated departments secure a similar level of external funding (per research active member of staff) as higher rated departments (though the average overall is lower) a clear recognition by users of the value of this research.

138. We do not accept that diversity is best maintained by imposing artificial barriers to institutions wishing to develop their research provision, or by restricting research funds to a limited number of institutions. If action needs to be taken to preserve the diversity of the sector it must be positive action to recognise the missions of institutions that are not primarily research-led.

139. Responses to the Call for Evidence confirmed our view that institutional autonomy is key to the ability of institutions to respond to the needs of their stakeholders regionally, nationally and internationally. We note that many emergent research areas are characterised by new forms of research linked to practice or work with local industry; these emergent forms of research are often well developed in the post-1992 sector.

140. However, efficiency gains are making it harder for institutions to invest in emerging areas. In many instances, staff are simply working so hard teaching there is no time to undertake research, and the fact they are working hard is a reflection of the fact that institutions cannot recruit staff in the right disciplines to reduce the overall burden.

141. A key question is whether the human resource management of institutions creates the most space for, and provides the greatest support of, staff who want to develop innovative research areas. We consider that there are opportunities for significant improvement in HR management within institutions.

142. Institutions have become significantly more strategic in the deployment of their resources, and as this develops further one would expect an increase in the rate of development of emergent areas.

However, there is a concern that the temptation to spread resources too thinly would persist, bolstered by the transparency of core funding methodologies.

143. We therefore believe that institutions should be encouraged and helped to develop capability in emerging research areas by specific support from the centre. However, we believe that the basis for special initiative funding might be quite different for disciplines which have recently entered HE, such as nursing, than for well-established subjects such as education or business and management.

Conclusions

Supporting world-class research

143. We welcome the proposal of the selectivity sub-group to define the different dimensions of excellence. However, we are concerned to ensure that such an approach does not constrain or direct the activity of researchers by imposing outmoded notions of how and why people engage in research, or deleteriously affect the interaction between research and other activities.

144. We believe that institutional autonomy is key to the ability of institutions to perform at the highest levels: they are best placed to optimise the value obtained from their diverse sources of funding, and to decide how to support the range of activities in which they are engaged. Only in this way can continuity be sustained and activities coherently developed.

145. We have seen no evidence that staff (essentially student) numbers are an inappropriate basis on which to establish the quanta for disciplines. Nor have we seen any evidence that particular areas are over-researched. However, we recommend that the HEFCE reviews the basis for establishing the quanta (and in particular the relationship between student numbers and funding quanta) in order to ensure that there continues to be a proper balance of research activities between disciplines.

146. We do not believe that there is a dichotomy between research of international quality and regional relevance, nor that there is any inherent conflict between developing excellent research and engaging with the regional agenda. However, there are dangers that research can become parochial and inward looking if it is not linked to the wider research effort.

Encouraging applicable research

147. We believe that new models of the way society interacts with higher education – a move away from the ivory tower and towards the HEI as a driver for wealth creation and social inclusion – need to be articulated as the framework for the relationship between teaching, research and the regional role of institutions.

148. We do not believe that there is an inherent conflict between undertaking applicable research with economic impact, and high quality research that pushes back the boundaries of knowledge.

149. However, we do recommend that strategic capability building is required in some areas, particularly where research is linked to practice-based disciplines such as nursing, business and management and education.

150. We also recommend that greater clarity is developed in the respective roles of QR and HEROBC funding. However, this should not preclude an enhanced HEROBC initiative directly funding research activity, where this is essential to the transfer of knowledge required by users.

Recognising and supporting collaboration and networks

151. We note the continuing growth of interdisciplinary and multidisciplinary research, and the concern that the RAE may cause students to think in terms of monolithic subject blocks rather than encouraging an understanding of the complex inter-relationships between activities and areas. We therefore welcome the proposal of the quality assurance sub-group that new panels should be established, where justified by the changing research landscape, in any future exercise.

152. Responses to the Call for Evidence and the findings of the HEPU consultancy study have confirmed that collaboration is pervasive in the sector: it is the rule and not the exception. However, the drivers of collaboration are diverse and the economic and intellectual benefits need to be well understood before the HEFCE considers whether it should, and could, promote collaboration directly. We conclude is that there is no case for HEFCE funding schemes directly focused on producing collaboration within the UK HE system as an end in itself. However, we do consider that explicit measures are required to promote collaboration in the provision of research training. We also recognise that, though not without its problems, EU funding does promote international collaboration, and we would welcome HEFCE measures to promote the collaboration of high performing units in English HEIs with their peers overseas.

153. We considered the implication of a national assessment and funding system for regional activity and international collaboration. We note that it is important that research in some disciplines is maintained on a regional basis. However, we believe that a national assessment process is essential to provide an appropriate benchmark. There should be measures to develop regional capability where there is a clear need, but this should be transitional rather than permanent, as this activity should become self-sustaining – funded either by project funders or by users.

Development of research people and production of PhDs

154. We consider it essential that academic staff should have been engaged in high quality research at some stage. We are also concerned about the lack of support for isolated research students who may be being trained in departments with little intellectual or physical support. The Call for Evidence indicated considerable support for the idea of concentrating research training, in order to ensure that students are able to secure appropriate access to career and research support and advice.

155. We believe that institutions should be required to implement mechanisms to ensure that a defined minimum standard of research training and career development is provided. We consider that physical or virtual concentration of research training will be required in order for many institutions to improve the research training and career development of those who have recently embarked on a career in research.

156. We believe that the role of scholarship in underpinning teaching should be explicitly acknowledged. However, we do not feel that it should be separately funded, rather that it is a legitimate call on teaching funding. However, we recognise that if research funding is allocated more selectively

staff/student ratios in some parts of the sector could fall significantly and this may create a case for explicit funding of scholarship.

Widening research

157. We note that although the intention of current HE policies is to increase diversity, there are concerns that the current system encourages convergence of institutional mission, as HEIs attempt to maximise their income from all possible sources of funding. The issue of institutional diversity is central to our terms of reference. We believe institutional diversity should be preserved by positive action to recognise and reward diverse missions, not by placing artificial limits on the legitimate research aspirations of institutions. Institutional autonomy is key to the ability of institutions to respond to the needs of their stakeholders regionally, nationally and internationally..

158. We recommend that institutions should be encouraged and helped to develop capability in emerging research areas by specific support from the centre. We also note that many emergent research areas are characterised by new forms of research linked to practice or work with local industry and these links should be supported and developed. However, we believe that the basis for special initiative funding might be quite different for disciplines which have recently entered, or developed, in HE, such as nursing, than for well-established subjects such as education or business and management.

159. It is clear form the work of JM Consulting that research has numerous benefits for teaching. It is therefore key that an appropriate research base is developed in new and emerging areas which are increasingly attracting large numbers of students.

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Annex A

Membership of the sub-group

Professor Howard Newby (Chair)	Vice-Chancellor, University of Southampton
Professor Roderick Floud	Provost, London Guildhall University
Dr Keith Taylor	Chairman & Chief Executive, Esso UK Plc
Dr Peter Dolyle	Chairman of BBSRC, Oxford Molecular and previously of Zeneca plc
Professor Anthony Chapman	Principal, University of Wales Institute, Cardiff
Professor Michael Brady	BP Professor of Information Engineering, University of Oxford
Professor David Westbury	Vice-Principal, University of Birmingham
Professor Alan Wilson	Vice-Chancellor, University of Leeds
Dr Diana Dunstan	Director of Research Management, Medical Research Council
Mr Bahram Bekhradnia	Director of Policy, HEFCE
Dr David Pilsbury	Head of Research Policy, HEFCE

Annex B

Terms of reference

To consider the relationship between research, teaching and other outputs of HEIs, and the potential for research collaboration between institutions. In particular to consider:

What is the impact on teaching of the drive to improve research?

- Have HEFCE policies promoted research at the expense of teaching?
- Does teaching subsidise research or vice-versa?
- What are the direct and indirect cross-benefits?
- Does undertaking research enable teacher-researchers to enhance the learning experience?
- How best to promote research activity synergistically with the promotion of high quality teaching and interaction with business and the community.

How to ensure that institutions can develop excellent research and engage with the regional agenda.

- How can promotion of excellence and international competitiveness on a national basis be best achieved without compromising institutions' ability to contribute fully to their regional economies and communities?
- Should funding be targeted to support current, or future, regionally significant activities?

To what extent can collaboration support the missions of institutions?

- Can collaboration facilitate the different missions of HEIs?
- In what areas research collaboration should be promoted and how it is most effectively promoted.

How to maximise the benefits of complementary funding by the HEFCE of teaching, research and work with business and the community.

- The flexibility, diversity and complementarity required in funding approaches.
- How to facilitate the optimal use of research resources by institutions to enable them most effectively to engage in their core activities.

Annex C

Full-time and part-time PGR students by region

	East Midlands		Eastern		London		North East		North West		Northern Ireland		Open University		South East		South West		West Midlands		Yorks and Humber		Total FT	Total PT
UOA	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT		
1	50	30	95	21	407	192	54	19	78	30	40	9			87	25	25	5	53	2	49	64	937	395
2	17	69	57	12	298	285	2	6	88	65	6	9			29	13	15	30	21	12	32	76	565	576
3	40	216	82	18	548	498	147	96	125	132	61	35			154	75	60	39	66	22	130	157	1,411	1,287
4					72	64	7	11	25	34	10	12					14	7	19	15	12	24	159	167
5	2	5			204	36			79	8											0	1	284	50
6	8	6	39	9	72	15			19	0	0	3			39	7			6	0			183	40
7			27	4	33	5	26	5	29	2	5	2			49	7	18	4	22	9	28	7	237	45
8	40	11	52	18	55	6			19	4					41	2	34	4	8	0	11	0	259	45
9	93	11			150	36	19	6	64	19	30	3			23	7	48	26	58	16	48	19	531	143
10	5	19	0	21	19	82			28	73	18	33			11	44	0	9	2	19	5	34	88	333
11	24	35	71	41	78	60	1	11	48	36	95	36			91	68	17	39	41	55	107	65	572	445
12	70	12	98	26	184	7	5	5	69	6					129	17	53	2	49	10	109	9	765	93
13	94	52	76	35	210	131	26	29	64	121	29	7	7	12	295	123	60	25	79	44	161	67	1,101	645
14	146	33	395	91	431	93	62	23	287	97	60	8	17	24	529	132	216	58	284	58	358	83	2,783	699
15	70	14	80	16	18	0	98	35			30	16			281	36	9	8	37	16	9	1	632	142
16	50	8			12	5	1	1			14	1			67	8	0	2			36	15	178	40
17			27	5	51	34			27	9							31	11					136	59
18	260	22	275	68	324	44	149	25	307	15	50	11	20	23	578	35	261	11	242	12	390	51	2,855	316
19	96	15	248	61	303	26	79	4	283	20	52	8	11	12	440	31	130	8	151	4	117	5	1,910	194
20	15	7	53	24	87	43	38	13	91	9	4	1	31	16	115	23	43	1	54	9	32	8	563	154
21	3	4	117	45	83	23	29	9	66	51	40	8	1	0	142	30	70	58	7	16	18	13	576	257
22	11	0	35	9	62	10	17	3	40	1	3	0	1	11	70	4	19	1	67	4	29	1	353	44
23	49	9	101	32	92	8	36	5	45	1					97	9	49	9	35	12	53	6	556	91
24	12	7	23	8	77	37	15	6	29	4			4	6	60	21	28	3	21	2	10	10	278	103
25	99	58	157	85	229	129	70	43	219	75	40	35	4	14	186	68	77	46	95	41	156	63	1,331	656
26	31	17	346	120	101	74	39	13	42	12	21	8	19	48	240	49	20	9	188	54	12	22	1,057	424
27	41	4	58	13	168	29	30	38	88	8	17	7			35	16	21	6	78	1	61	16	597	138
28	43	25			134	28	73	46	111	32	22	9			74	51	19	6	53	8	107	47	635	252
29	138	46	25	8	293	105	59	38	196	23	39	19	1	0	358	109	112	27	105	23	203	79	1,528	476
30	193	124	300	120	267	120	35	28	188	61	40	14			229	71	120	64	75	53	228	125	1,674	779
31	10	8			31	5											11	11			15	6	66	30
32	48	18	99	27	175	41			220	33	13	11	4	9	89	18	16	9	92	17	169	28	924	210
33	80	71	44	5	115	56	21	37	51	100	14	15			27	21	11	14	29	26	69	51	459	394
34	6	7	53	22	22	22	11	16	25	13					23	22	23	16	3	6	31	29	196	152
35	46	35	143	40	141	70	66	33	48	23	9	2	8	13	177	47	89	24	61	20	129	39	916	345
36	45	28	138	27	152	119	19	18	43	23	14	5			188	48	34	16	58	36	56	33	745	352
37			103	30	163	57	9	10	20	4	6	4			85	30					10	6	395	140
38	69	28	136	33	212	91	28	14	53	13	1	1			200	39	52	14	60	2	54	11	864	244
39	22	22	64	8	332	218	38	34	89	29	13	24	0	6	272	84	41	19	80	37	103	70	1,053	550
40	9	24	2	2	64	156	14	41	22	30	18	15	7	26	52	64	44	36	14	19	47	56	292	468
41	1	15	6	40	7	12	0	1	17	46	10	11			8	21	7	20	17	34	13	16	85	215

UoA	East Midlands		Eastern		London		North East		North West		Northern Ireland		Open University		South East		South West		West Midlands		Yorks and Humber		Total FT	Total PT
42	77	69	118	90	111	132	15	60	119	67	15	20	7	17	84	64	50	41	48	40	41	34	685	632
43	132	148	184	143	299	342	16	65	222	173	26	54	8	22	147	121	61	172	198	183	151	212	1,441	1,633
44	0	1	19	4	18	7	2	2	29	6	3	0			2	6	6	3					79	29
45	25	28	15	3	13	17			5	7					12	13			30	13	2	1	102	81
46			23	3	42	27	25	6	12	9					60	10	11	7	7	7	15	1	195	69
47			23	3	38	7	4	2							20	4					33	18	118	34
48	4	3	1	0	7	16	2	6	31	22	7	3			32	24	11	10	22	26	15	12	132	122
49											6	5			1	0	0	8					7	13
50	59	71	202	82	138	124	32	36	76	82	14	17	4	16	291	97	50	39	105	101	159	88	1,129	752
51	16	11	51	8	31	30	3	6	7	3	8	2			59	18	9	3	7	0	21	15	210	94
52	10	6	16	5	22	19	2	5	6	3	1	2			29	5	5	0	23	14	11	10	123	68
53	0	1	13	3	10	4			2	1					31	7	1	1	3	3	4	2	63	21
54	5	4	2	2	14	1	1	2	0	2					9	1	4	1	3	2	7	5	45	20
55	11	9	20	1	18	19	1	4	8	1	3	1			15	2	5	5	10	5	9	19	100	66
56			80	22	50	28	23	20	32	58					78	9					16	8	278	143
57	6	1	73	12	32	14	10	13	9	8	5	1	0	8	98	18	13	8	27	5	3	2	276	90
58	13	17	59	25	61	23	23	16	16	5	10	4			103	35	26	19	11	4	74	41	397	188
59	48	91	392	135	233	198	27	47	74	91	18	9	6	26	378	192	25	62	68	76	103	69	1,371	996
60	11	18	71	15	123	139	2	4	21	11			1	6	40	56	6	7	15	7	24	10	314	273
61	14	12			24	19	4	3	18	5					4	2	1	7	4	8	16	13	85	69
62	4	4	85	32	81	62	15	3	11	31	5	10	1	7	66	32	10	2	47	28	51	42	375	253
63	6	16	71	17	60	70	39	60	45	46	7	29	0	10	78	41	35	53	70	86	45	81	456	508
64	26	28	2	10	145	149	14	7	21	22	4	4	2	7	49	60	19	26	27	37	10	22	318	371
65	36	26	14	7	61	53	2	6	1	3	13	20			17	19	1	16	42	26	8	40	194	215
66	7	13	5	7	51	56	0	1	11	9	3	2			42	48	15	20	13	15	8	3	155	172
67	6	10	34	28	74	69	11	23	27	21	10	8	3	7	67	36	12	15	23	37	52	48	318	301
68	56	503	111	246	191	622	23	288	108	208	7	59	29	55	176	342	123	340	94	302	121	408	1,040	3,372
69	54	36	1	1	15	18	2	4	43	48					21	20	10	8	28	18	24	40	198	193
Grand Total	2,652	2,229	5,309	2,045	8,434	5,331	1,620	1,407	4,291	2,197	982	626	196	401	7,567	2,747	2,402	1,568	3,255	1,756	4,222	2,653	###	###

Source: Research Activity Survey

Annex D: Analysis of the relationships between institutional expenditure and staff and student numbers