

Response to the DfES consultation on the reform of higher education research assessment and funding

We are pleased to respond to the Department for Education and Skills' consultation on the Reform of higher education research assessment and funding (DfES 2006)¹ on behalf of the UK Computing Research Committee (UKCRC). The UK Computing Research Committee (UKCRC), an Expert Panel of the British Computer Society, the Institution of Engineering and Technology and the Council of Professors and Heads of Computing, was formed in November 2000 as a policy committee for computing research in the UK. Its members are leading computing researchers from UK academia and industry. While our response is from the perspective of Computer Science and Informatics we believe that many of the issues we highlight are reflected across the UK research community as a whole.

Before responding to the specific consultation questions it is worth reflecting on the objectives underpinning any form of research assessment and targeted funding. In particular, it is important that the approach adopted incentivises the behaviours required to maximize the benefits of investment in HE research. The Science & Innovation Investment Framework 2004-2014² highlights the importance of strengthening the UK research base and promoting knowledge transfer and innovation. This requires a vibrant and healthy research culture, aligned with national needs, and in particular

- The continuing production of research outputs that set the international research agenda and place the UK at the lead in key research areas.
- The development of UK research capacity in key areas, through the development of new researchers in response to changing needs.
- The encouragement of research-led higher education and training promoting strong links between HE teaching and internationally leading research.
- The use of research outputs to drive future innovation and economic growth.
- The use of research outputs to meet societal needs and have a significant impact on key societal challenges.
- The promotion of adventurous, creative and interdisciplinary research activity.
- A funding regime that encourages co-investment by the Research Councils (and charities) and individual HEIs to provide sustainable support for world-class research.

It is essential that any model of research support promotes and rewards these behaviours and our responses to the detailed questions reflect this. By focusing on metrics based on research funding, the current proposals for a metrics-based approach fail to recognise and promote the majority of these key behaviours. We would suggest that any metrics-based system needs to balance the input measure of research funding with output and impact measures that promote these key behaviours. Identifying appropriate key measures for these behaviours should be a priority for a metrics-based approach if it is to meet the objectives of the Science and Innovation Investment Framework 2004-2014.

With the continued growth in on-line information and the ongoing development of increasingly sophisticated research management information systems the potential exists to increase the evidential bases available to support the assessment of research. We would like to stress on behalf of the Computer Science and Informatics (CS&I) community that realizing this potential involves major research challenges, and would caution against a premature shift to a metrics-only approach. Rather we would suggest the need in the short term to consider how we might provide an evidential base to inform future light-touch peer-based judgment of research. This is a contribution the CS&I community would be very well placed to make.

1. Which, if any, of the RAE 2008 panels might adopt a greater or wholly metrics-based approach?

Significant effort has already gone into the development, publication and refinement of the working methods and criteria for the various panels and sub-panels set up for RAE2008, which suggests

¹ <http://www.dfes.gov.uk/consultations/conDetails.cfm?consultationId=1404%20>

² http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

that some caution should be applied in changing them now. Each panel has met to debate the evidence it can draw upon (including a range of metrics) and each has published criteria that represent its best professional judgement on how to conduct the assessment. The extent to which metrics are comparable varies tremendously not only between disciplines but within disciplines. As a case in point CS&I involves a broad range of research traditions and it is unclear that all its research activities fit easily into a STEM framework.

The current RAE criteria place considerable emphasis on research outputs (70% in the case of CS&I), which is at odds with the dominance of input metrics (research funding) in the current proposed models. The development of appropriate output metrics requires considerable exploration, verification and significant debate across the community which will take some significant time. The primary assessment mechanisms should remain peer judgement informed by a broad evidence base.

We would note that adopting a greater metrics-based approach at the same time as running a shadow metric-based exercise could seriously undermine the validity of the experiment. The comparison would not be independent.

2. Have we identified all the important metrics? Bearing in mind the need to avoid increasing the overall burden of data collection on institutions, are there other indicators that we should consider?

Although the models proposed in the document exploit a single input metric (research income) the consultation document outlines a number of candidate metrics for research assessment that might be considered. These proposed metrics need to be considered with a degree of caution:

- The peer review of grants is an assessment of research potential rather than research output. Moreover, this assessment is often undertaken within the context of broader strategic drivers and targeting funding programmes.
- Peer review of end of grant reports provides useful immediate information on the management and execution of the research at the point of its completion. Generally this is too early to provide an indication of the impact of the research with evidence emerging as research outputs are drawn up long after the end of grant report is submitted.
- Research Council International Review Panels, while providing international benchmarking of the research activities are aligned to broadly-based research programmes rather than providing discipline-specific benchmarks. Moreover, the benchmarking involved considers the UK research community as a whole and does not seek to differentiate between institutions.
- Research plans developed by individual institutions tend to be both sensitive and aspirational in nature and it is not clear the extent to which these can be used to indicate the quality of research.
- Bibliometric data needs to be considered with some care, as the practice of publication varies considerably across research communities. The interpretation of bibliometric data requires significant professional judgement in its interpretation. This is particularly true given the wholesale shift in publication patterns currently taking place with the growth of on-line publication.

While recognising the need to avoid increasing the overall burden of data collection on institutions we have significant reservations about the interpretation of existing data or repurposing data that has been collected for alternative purposes. The collection of research data already represents normal practice across the HE sector. What is imperative is that data collected for internal management purposes is aligned with the needs of external assessment and would encourage a dialogue to take place across the sector to agree a common approach to the collection and analysis of data.

3. Which of the alternative models described in this chapter do you consider to be the most suitable for STEM subjects? Are there alternative models or refinements of these models that you would want to propose?

We feel the reliance on a single input measure as a means of assessing research to be flawed. It fails to recognise and reward the full set of activities required to underpin a vibrant research community and meet the knowledge transfer objectives of the Science and Innovation framework.

The proposed models all reflect a strong correlation between research funding and RAE reported

in the “Science and innovation investment framework 2004-2014: next steps” document³. The inferences that can be drawn from correlation are open to some debate and need to be interpreted with considerable care (for example, institution size is a strong influence in this correlation). This point is elaborated in paragraphs 40-44 of the “Using metrics to allocate research funds” document⁴ produced by the Higher Education Policy Institute. In addition there is no guarantee that correlations observed in the past will remain valid if the metrics are then used for a different purpose, i.e. to drive the system.

The models within the consultation document also fail to separate capital funding from research volume funding or to differentiate in the variability of staffing costs across different research areas. A shift to more indicative measures of research volume (e.g. staff effort supported) should be considered.

All the models are driven by the current distribution of Research Council funding between different disciplines, and would thus amplify any anomalies. CS&I is a case in point, where Research Council investment seems to lag that of our major international competitors. Linking QR to research income, rather than the current output-dominated distribution would thus further weaken the discipline. We do not believe that CS&I is an isolated case, and believe it would be dangerous to reduce the scope for HEIs to influence the research agenda by investing in areas of high output quality and impact, irrespective of their current level of external funding. This may also stifle institutions’ willingness to embark upon research in new and emerging areas which have yet to gain recognition and support from Research Councils and in high risk research areas where the link to research funding is uncertain.

An issue of some concern is the variability of results across the five suggested models. The impact of changes in the model is sufficiently radical (over 200% in some cases) to raise questions about the stability of the measures underpinning the models.

The models that use pot-based approaches (B,D) have the advantage of mediating some of the undesirable effects. However, they may do so at the cost of the ability to react to changing circumstances. The process through which these pots are defined needs to be informed from professional judgement and how this is to be achieved beyond RAE 2008 needs to be considered.

If any of these models are to be used in the future we would suggest a number of specific refinements.

- The results of these models should only be used to inform a peer review process with the results having been validated using professional judgment.
- The models need to differentiate between capital and facilities investment and research volume measures (e.g. effort of research active staff). The developed models may wish to exploit the recent formulation of a Large Facilities Council to help in this matter.
- Some lightweight process needs to be developed to refine and update the definitions of the pots used in the pot-based approaches.
- The definition of the pots needs to be informed by broad set of measures reflecting the whole spectrum of activities involved in research.

4. What, in your view, would be an appropriate and workable basis for assessing and funding research in non-STEM subjects?

We find the separation between STEM and non-STEM subjects to be problematic. Disciplines such as CS&I bring together a broad set of research traditions with a diversity of metrics, and do not readily sit with either model. The suggestion of differential approaches is particularly concerning in terms of interdisciplinary work that blend these different approaches together. Given the consultation document’s stated aim of recognising and rewarding collaborative and interdisciplinary research, it is essential that assessment mechanisms do not introduce division between different research approaches and traditions.

We would see the model proposed in appendix II of the document for the assessment of non-STEM subjects to be equally applicable to STEM based subjects. Indeed, we would suggest that the method suggested would alleviate many of our concerns about metric-based approaches and would provide a better basis for the assessment of all subject areas.

³ http://www.dti.gov.uk/science/science-funding/framework/next_steps/page28988.html

⁴ <http://www.hepi.ac.uk/pubdetail.asp?ID=207&DOC=Reports>

5. What are the possible undesirable behavioural consequences of the different models and how might the effects be mitigated?

All assessment and funding models have major behavioural consequences. We would suggest that the desired behaviour should be the starting point for the definition of metrics, the means of measurement and the model of funding. This means that any metric-based approach needs to identify, measure and reward desirable behaviour.

These measures need to be open to a process of on-going and continual validation and refinement to respond to any unanticipated and problematic effects on behaviour.

The currently proposed emphasis on research funding, and the lack of measurement of research outputs is likely to result in a range of negative behaviours. These would include

- Overloading of research funding bodies and the peer review process as submissions increase.
- The need for internal review process within institutions to reduce the loading on research funding bodies requiring increased energies and efforts.
- A shift of energies to development of research proposals at the cost of undertaking research work.
- A schism between research activities and funding, and teaching, reducing the extent to which research informs teaching.

We would endorse the more detailed elaboration of the potential effects provided in the document "Using metrics to allocate research funds" produced by the Higher Education Policy Institute⁵.

6. In principle, do you believe that a metrics-based approach for assessment or funding can be used across all institutions?

It is unlikely that a simple metric or set of metrics are available that can simply be applied across all subjects and all institutions. The diversity of institutions and subjects is such that some form of professional judgement will be required to interpret these metrics, at least for the foreseeable future.

A significant and real challenge that will need to be addressed in order to allow metrics to be applied across institutions is the need for some sector-wide agreement on data collection approaches and techniques. The danger is that the approaches to collection of metrics will diversify and this will introduce significant overhead. We believe emphasis needs to be given to a debate on standard techniques and approaches to data collection which incorporates best practice and results from statistics, computer science and other areas.

7. Should the funding bodies receive and consider institutions' research plans as part of the assessment process?

It is uncertain how institutions' research plans would be used as part of a metrics-based assessment process. Planning statements will vary significantly from institution to institution and will be closely tied to the management style, strategic orientation and even geographical location, of the institution involved. Interpreting these plans will require significant professional judgement and it is not clear that they could be understood outside the context of a particular institution.

The normal strategic use of research plans is that they set targets and outline the aims and aspirations of organisation. Their use in the assessment of research performance would need to take into account this difference. It would be unlikely that existing institutional plans would provide the correct level of detail of information.

We would also be concerned about the impact of confidentiality and internal decision making and would imagine that institutions would naturally seek to write additional plans for external consumption.

8. How important do you feel it is for there to continue to be an independent assessment of UK higher education research quality for benchmarking purposes? Are there other ways in which this could be accomplished?

We strongly believe an independent and transparent assessment of the international standing of

⁵ <http://www.hepi.ac.uk/pubdetail.asp?ID=207&DOC=Reports>

UK research quality is essential. It provides a key resource in the planning of research strategy both nationally and within institutions where key strategic decisions can be informed by an international perspective.

A key strength of the existing RAE process is the peer review of research outputs as a means of indicating the quality of the research produced and its potential impact. The value of this professional judgement is not to be underestimated and goes beyond its use as a resource allocation mechanism. It provides a means of comparison across UK institutions and a clear indicator of the international importance of the research.

While we believe that metrics have a role to play in the assessment of research, at individual subject level we believe these metrics need to be understood and interpreted. Peer review should have a significant role to play in this process. We would encourage a model where metrics are developed with the intention of informing the professional judgement lying at the core of peer review.