THE RESEARCH QUALITY FRAMEWORK (RQF)

Responses to the Issues Paper – Submission Cover Page

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If Yes:

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A report on the outcomes of this submission process will be prepared by the Department and/or external consultants which will be made publicly available on the Department's website. Quotes may be used from submissions in this report. Does the organisation consent to being identified in a report?	Yes

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Part 2: Creating an Australian RQF

Please indicate your response by placing an X in the relevant box.

2.1 Structuring an RQF

Issue 1: How should an RQF be applied to universities and publicly funded research agencies?

(a) An RQF should be applied in the same way to both universities and publicly funded research agencies.

☐ Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree X Somewhat disagree

(b) Within the university sector, an RQF should be applied differentially to specific types of institutions.

☐ Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree X Somewhat disagree

Additional comments

In as much as the missions of universities and publicly funded research agencies can be different, it might not be appropriate to judge both with the same measures. However, it is important that the different measures not have the effect of cutting funding for high quality research in one sector to support low quality research in the other.

It is important collaborative research involving universities and publicly funded research agencies not be disadvantaged or discouraged by the RQF.

It is argued elsewhere that the RQF evaluation exercise should be applied to disciplines rather than to institutions.

2.2 Defining and measuring research quality and impact

Issue 2: Research quality and impact should be assessed by appropriately constituted panels.

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

Additional comments

It is essential that the evaluation be able to deal with the differences between and within disciplines, and this will only be feasible with different panels for Mathematical Sciences, Information Sciences, Physical Sciences, Chemical Sciences, Biological Sciences, and so on. In the Mathematical Sciences, a number of discipline experts will be essential to give the panel a deep understanding of research in mathematics, statistics, operations research and other Mathematical Sciences. At the same time, many of the exciting new research directions, such as Bioinformatics and Financial Mathematics, are multidisciplinary, and so the panels will also need to include persons who understand the interdisciplinary interactions. In the Mathematical Sciences, these interactions occur in areas such as demography that are usually seen as lying in the humanities, as well as in the traditional areas of science and engineering, so the panels will need to have real breadth as well.

2.3 Measuring research quality and impact

Issue 3: Assessment panel members should include the following (the categories are not necessarily mutually exclusive):

(a) Experts reviewers able to assess impact in a discipline area/academic field.

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

(b) Expert reviewers able to assess impact more widely.

☐ Strongly agree ☐ Strongly disagree ☐ No comment

X Somewhat agree ☐ Somewhat disagree

(c) International expert reviewers.

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

Additional comments

The Australian Mathematical Society is concerned about “impact”, and how this is evaluated. Hardy’s work in number theory, carried out in the period 1910–1940, appeared to have no impact at the time, but now underpins essential technological applications, including the coding of information for automatic teller machines and internet commerce. It seems unlikely that any evaluation panel can see far enough into the future to reliably evaluate “impact”. This is closely linked to the comment about “half-lives” in the response to issue 4 below.

Issue 4: Assessment panels should be informed by metrics whose nature and relative influence may vary across different disciplines.

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

Additional comments

The differences between disciplines, even within the sciences, are very well documented. For instance, papers in the mathematical sciences have much longer “half-lives” than papers in the physical or chemical sciences. It would not be possible to use the same measures to deal adequately with these disciplines.

2.4 Measuring research impact

Issue 5 (a): **An RQF should recognise research impact through the measurement of different outcomes for different types of research and disciplines.**

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

Issue 5 (b): **An RQF should recognise the production and diffusion of technology and knowledge as elements of research impact.**

☐ Strongly agree ☐ Strongly disagree ☐ No comment

X Somewhat agree ☐ Somewhat disagree

Issue 5 (c): **Where appropriate, users and those commissioning research should contribute to the assessment process by providing an external perspective on research under consideration.**

☐ Strongly agree ☐ Strongly disagree ☐ No comment

X Somewhat agree ☐ Somewhat disagree

Additional comments

As already observed, different disciplines have different time-scales for the development of research. Similarly, outcomes are different. But the production and diffusion of knowledge must underpin any worthwhile research in any area. Technological development may or may not be important, and may occur well after the responsible researcher has passed away, so, at least in the mathematical sciences, it would be inappropriate to pin research evaluation to technological uptake.

Part 3: Applying an Australian RQF

Please indicate your response by placing an X in the relevant box.

3.1 Level of aggregation for assessment

Issue 6: What is the most appropriate level of aggregation for assessment?

X Subject/discipline area

X Research grouping/research team/s

☐ Department/schools

☐ Faculties/Divisions

☐ Institutional level - university/PFRA

Additional comments

In Australia, Mathematical Scientists reside in Departments and Schools of Mathematics, but also in Schools and Departments of Physical Sciences and of Biological Sciences, as well as within Faculties of Business/Commerce/Economics. It follows that no review based on Departments, Schools, Faculties or Divisions could adequately evaluate work in the Mathematical Sciences. Moreover, given the enormous diversity within Schools, Faculties, and Universities (for example, there are Schools which embrace Mathematics, Physics and Electrical Engineering, and Faculties with even greater breadth), it would be impossible for any panel which reviews Departments, Faculties, or Universities that is small enough to be manageable to provide sound evaluations.

3.2 Who should be assessed?

Issue 7: Who should be assessed as part of an RQF?

☐ Eligible staff nominated by institutions (based on guidelines to be provided)

☐ All eligible staff

Additional comments

This is a thorny question. In the UK, the Research Assessment Exercise, which is based on evaluating eligible staff, has had damaging consequences. It is also a concern that some institutions might not wish to nominate members of their staff involved in teams in which the institution is not one of the leaders, and the proper evaluation of the work of teams is certainly one of the functions of any evaluation of research. On the other hand, many universities quite rightly employ at least some of their staff for their teaching skills, and any research assessment which included these people might, in the longer term, have negative effects on the quality of instruction in universities. Perhaps other options need to be explored.

3.3 Link to training of researchers

Issue 8: **The training received by higher degree students in research requires a separate quality audit and/or assessment process.**

☐ Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree X Somewhat disagree

Additional comments

The exercise mooted here is extremely wide-ranging and risks having unforeseen outcomes. It is essential that we get research evaluation right before we open up any more Pandora's boxes! At the same time, in the longer term, research training should be informed by the same audit process, in order to maximise the benefits of this kind of evaluation and minimise the costs of implementation.

3.4 Focus of assessment

Issue 9: **Assessment for an RQF should include a forward-looking strategic element as well as being based on past performance.**

X Strongly agree ☐ Strongly disagree ☐ No comment

☐ Somewhat agree ☐ Somewhat disagree

Additional comments

An assessment based solely on the past could have a stultifying effect on innovation. All the sciences evolve, and the RQF must support this evolution with a strategic component.

3.5 Reporting arrangements

Issue 10: How should the outcomes of an RQF be reported?

(a) Reporting the outcomes of an RQF should be aligned to:

X Subject/discipline areas

X Research grouping/research team/s

☐ Department/schools

☐ Faculties/Divisions

☐ Institutional level – university/PFRA

(b) Reporting on subject/discipline areas within any level of aggregation for the RQF should be aligned to the ABS RFCD codes or an appropriate subset.

☐	Strongly agree	☐	Strongly disagree	☐	No comment
☐	Somewhat agree	X	Somewhat disagree		

Additional comments

The way in which the exercise should be conducted (see issue 6) must inform the way in which it is reported.

The ABS: RFCD codes are not sufficiently wide-ranging or detailed to properly cover all the areas of research in the mathematical sciences, and should not be used without extensive revision and the development of a regular updating process.

Issue 11: What should be the format of the ratings/rankings/benchmarks of an RQF? Please provide examples.

It might be argued that it is the over-simplified format of the ratings in the British Research Assessment Exercise that causes some of its more bizarre consequences. At the same time, an excessively complex reporting mechanism may mean that the whole exercise has no teeth, and the potential benefits of the exercise are lost. The Australian Mathematical Society suggests that this decision requires a great deal of care, but cannot offer a solution.

3.6 Links to funding

Issue 12: **The resource intensity required for an RQF should be directly related to the level of funding that it informs.**

☐ Strongly agree ☐ Strongly disagree ☐ No comment

X Somewhat agree ☐ Somewhat disagree

Additional comments

It is important that this exercise is carried out well, and does not need to be repeated often. There can be real benefits for the national research effort if this is the case, but otherwise not. The RQF will necessitate substantial additional funding, which should be released through the reduction of expenditure on some of the other reporting mechanisms related to research.

3.7 Administrative benefits

Issue 13: **An RQF ought to lead to commensurate reductions in reporting requirements for other Australian Government research accountability mechanisms.**

X	Strongly agree	☐	Strongly disagree	☐	No comment
☐	Somewhat agree	☐	Somewhat disagree		

Additional comments

A well-constructed RQF will be expensive in terms of time and effort. It is therefore important for the potential benefits to be realised. These include better use of resources for research support and reducing paperwork in other areas.

OTHER COMMENTS

If you have additional ideas or comments on areas not addressed in the paper we invite you to provide these in this submission.

Risk-taking, diversity and multi-disciplinary research: The Australian Mathematical Society is concerned to ensure that the Research Quality Framework (RQF) does not prevent mathematical scientists from moving into new fields, or from taking research risks in other ways. Neither should it reduce the diversity of excellent research in the mathematical sciences in Australian universities, nor impede interdisciplinary work involving the mathematical sciences.

In the mathematical sciences, unintended consequences of the British Research Assessment Exercise (RAE) have been to reduce both risk-taking and diversity. (Both these problems were highlighted by the International Review of Mathematics.) In particular, the British RAE has operated to reduce the diversity of places where excellent research is conducted, to reduce the range of fields where excellence can be found, and to reduce the cohesiveness of the research community in the mathematical sciences.

More generally, any RQF that focuses on traditional science departments, or disciplines, will tend to experience difficulty judging, and encouraging, research that is conducted across boundaries. Many of the frontiers on which the mathematical sciences are expanding today are multidisciplinary.

In Britain, some of the problems caused by reduction in diversity have been overcome by hiring scientists from abroad, especially from continental Europe. In the Australian environment, however, our distance from both Europe and North America makes it relatively difficult to attract mathematical scientists from those places. (Potential appointees fear scientific isolation, and isolation from their extended families.) To a significantly greater extent than in Britain, Australian science is a “closed cycle”. We appear to have relatively little opportunity for filling gaps in strategically important areas, by hiring mathematical scientists from abroad. Any decline in scientific diversity is therefore an especially serious problem for us.

In summary, any RQF for assessing, and rewarding, research excellence in Australia must be carefully constructed to avoid the obvious dangers that the unique Australian situation presents. It should encourage risk taking, it should increase diversity and it should not impede multidisciplinary research.

The enabling sciences: The Australian Mathematical Society, in common with professional societies in other fields, such as physics and chemistry, notes with substantial disquiet the marked decline in the enabling sciences in Australia during the last decade. The Society is concerned to ensure that the RQF reverse this trend.

The enabling sciences in Australia are in serious difficulty. Even the Government's Innovation Report for 2004–05, which takes a particularly up-beat view of the state of the nation's science enterprise, acknowledges that the decline in the proportion of year-12 students studying science, and participation rates at university, are so great as to suggest that “the long-term sustainability of Australia's skills base in the enabling sciences could be under pressure”.

This fall in Australia's ability to teach at a high level in the enabling sciences, is combined with a marked drop in our capacity to undertake excellent research in fields such as mathematics, physics and chemistry. One way of quantifying the problem is to note that the numbers of university staff working in these fields have fallen by between 30% and 40% during the last decade. (The figure is 38% for the mathematical sciences.)

It may be very difficult, in the near future, to ensure that Australian university students acquire world-class research training in science more generally, given the state of the enabling sciences. A recent review of the geosciences in Australia remarked on:

"... the decline in the number of teaching staff in physics, chemistry, mathematics and earth sciences over the past decade. Clearly, the well-being of geosciences rests on a foundation of the enabling sciences. If, say, physics disappears from a university curriculum, the study of any physical science at that institution ceases to be realistic."

Similar remarks could be made about research and research training. Unless the RQF operates to enhance the enabling sciences in Australia, and to support the essential role they play in research across the spectrum of science and engineering, the nation's research performance as a whole will suffer.

Methodology for quantifying excellence: The Australian Mathematical Society is concerned that the RQF make very careful use of quantifiers of research performance, and take full account of the very different approaches to research that operate in different fields.

The Australian Government, for example through Australia's Chief Scientist, has from time to time suggested that citation indices (e.g., numbers of citations, or publication counts in journals identified by impact factors) should play a major role in the distribution of block-grant research funding to universities. However, it is very difficult to see how this could be done without seriously degrading the treatment of fields, such as mathematics, where unique research cultures can produce relatively low citation rates, even for the most significant and influential research contributions.

Even within the mathematical sciences, citation rates differ very widely. Top-cited mathematical scientists almost invariably come from relatively applied fields, such as statistics, rather than from the more basic areas, such as theoretical mathematics. Indeed, any use of citation data, other than an extremely careful one, could result in a dangerous penalisation of research in theoretical mathematics, where Australia is currently very strong.

To stress the importance and subtlety of this point, one can hardly do better than note the comments of the world's most highly cited mathematical scientist, David Donoho, a statistician at Stanford University. He mentioned some of the pitfalls of citation indices in an interview he gave last August:

"Statisticians do very well compared to mathematicians in citation counts. Among the top ten most-cited mathematical scientists currently, all of them are statisticians. There's a clear reason: statisticians do things used by many people; in contrast, few people outside of mathematics can directly cite cutting-edge work in mathematics. Consider Wiles' proof of Fermat's Last Theorem. It's a brilliant achievement of the human mind but not directly useful outside of math. It gets a lot of popular attention, but not very many citations…"