

COUNCIL FOR THE MATHEMATICAL SCIENCES

The Institute of Mathematics
and its Applications

The London Mathematical
Society

The Royal Statistical
Society

The Effectiveness and Efficiency of Peer Review

The Council for the Mathematical Sciences, comprising the Institute of Mathematics and its Applications, the London Mathematical Society and the Royal Statistical Society, is pleased to present its response to RCUK's Effectiveness and Efficiency of Peer Review consultation. This response has been prepared by a working group consisting of representatives from the three societies as part of the Council's ongoing role of representing the interests of the mathematical sciences to government and other public bodies.

In the paragraphs below, the proposals for modifying the current system of peer review are commented upon in some detail. However, we begin with our conclusions.

Conclusions

Of the proposals, the greater use of outline proposals seems to be the most suitable for mathematics. Small groups, and even isolated researchers, are common in the mathematical sciences and it is important that they are not disadvantaged. The peer review system, albeit with a light touch, is the best way to ensure a fair outcome.

Mathematical research is people intensive, and compared with other areas of Science, has relatively modest demands for equipment, facilities and consumables. Therefore, the RCUK should look to make the process more discipline specific. They might also look at the systems for mathematical research grants which operate in other countries.

Comments on the proposals

1. Consolidation of Research Grant Funding

This approach risks duplicating the RAE which, in effect, gives out consolidated funding every few years. Whilst security of funding advantages large groups, it does require a substantial number of staff members to work on a fixed major field for many years. This is harder to achieve in the mathematical sciences than in other subjects and is detrimental to the checks and balances in making sure that research money is spent on the best and most exciting emerging ideas.

Small groups of excellent researchers are common in the mathematical sciences and these groups/individuals could be marginalised within a department.

2. Institutional level quotas

This approach replaces external peer review of the quality of a proposal with an internal (and often political) assessment of worth, which is subject to an institutional level agenda, lessens impartiality, and is simply transferring the cost from the Research Council to the institution. The institution would be expected to attempt to rank proposals from completely different scientific areas which, almost certainly, would not lead to a fair ranking of proposals for mathematical sciences when viewed at a national level.

Without an allocation for each discipline, quotas risk institutions preferring to submit applications for subjects with high cost value. Researchers in subjects that typically make smaller research proposals, such as the mathematical sciences, might be prevented from applying.

It is not clear at what point institutional level quotas would be reviewed. Without regular reviews, RCUK risks complacency in institutions with a large quota and stifling research in others.

3. Controlling resubmissions.

Inviting resubmissions is a promising idea but would require active steps taken by the Research Councils to provide helpful feedback. These resubmissions would, quite reasonably, expect a high rate of success and, therefore, the invitations would have to be very selective.

It seems to be assumed that resubmitting is a bad thing. However, with a low success rate, many good proposals fail and it is certainly less time consuming to adapt a narrowly failed proposal than to create a new one. Asking referees to decide whether a proposal is 'too similar' to a previous proposal increases the burden.

4. Greater use of outline proposals.

This idea has merit since it preserves the concept of peer review and is fair to all groups, large or small, irrespective of which institution they are associated with.

It may, by introducing an extra stage, increase the time from the initial proposal to funding for a successful application. It may increase the number of proposals. Does this system already exist within Research Councils to screen out proposals which have little chance of success?

5. Assessing economic impact.

This is neither feasible nor desirable in the mathematical sciences. It is very difficult to predict which areas of current mathematical research will have the greatest economic impact. Any economic benefits are often so much further down the line that it is highly doubtful that reviewers can comment sensibly on this. For example, would a reviewer, in 1917, assessing Radon's treatise on inverting an integral transform, have realised that he/she was witnessing the birth of X-ray tomography? The current use of classical number theory in cryptography is another example.

Research Councils can, and do, have initiatives which allow funding to be skewed towards areas considered to be important for the national economy. In responsive mode, further differentiation would be inappropriate.

General Comments

The research grant is now viewed as a 'must have' accessory by Vice Chancellors anxious to improve the RAE ratings of staff. This has probably contributed substantially to the growth in research grant proposals. Perhaps a negative metric is required for poor proposals.

The efficiency of the whole application process could be improved by making it discipline specific. At present, EPSRC proposals appear to be either fully funded or rejected outright. Allowing the panels the flexibility to offer reduced awards could also improve efficiency. However, the mathematical community is generally supportive of the current procedures used by EPSRC in responsive mode.

The ideal success rate is subjective. One might expect a higher success rate in an area in which the UK excels, such as mathematical sciences.