

# Mathematical sciences questionnaire report

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## Background

The National Strategic Review of Mathematical Sciences Research in Australia titled ‘Mathematics and Statistics: Critical Skills for Australia’s Future’ covered the spectrum of mathematical activity from school mathematics to advanced level postgraduate courses and research. It had two priorities:

- (1) An improved funding model for mathematics and statistics, and
- (2) Funding for national infrastructure, initially specifically through improved funding for the Australian Mathematical Sciences Institute (AMSI).

The Review’s five key recommendations were linked to actions and key performance indicators (KPIs).

The 2007 May budget provided new funding for mathematics and statistics. Prior to this, AMSI was invited to apply for an out-of-round Collaboration and Structural Reform (CASR) grant. The CASR grant fell well short of the funding recommended in the Review. Further, it became apparent that very little of the new money for mathematics and statistics was being used to support and strengthen mathematical sciences departments in the universities.

At the beginning of 2008 a questionnaire was sent to Heads of Mathematical Sciences in the universities. The questionnaire sought to identify the extent of the flow of new money to mathematics and statistics and responses to the KPIs that were linked to this funding.

## Responses

The questionnaire was sent to 40 Heads of Mathematical Sciences ‘units’. In two universities statistics is taught in a different faculty. Responses were received from 34 Heads. Of the remaining six institutions, it is likely that only one presently offers a three-year sequence in mathematics and/or statistics and this one is unlikely to continue to do so. This will affect a three-year statistics program being offered by another university that did respond. The viability of their three-year sequence depends on course-sharing with the non-responding institution currently offering a three-year sequence.

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Some general observations:

- There seems to have been a general assumption that in excess of 50% of the new money would go to administration.
- Many departments are trying to do more with fewer resources. One, with less than 10 staff, is teaching up to and including honours with no collaborative teaching through AMSI or the Access Grid network.
- At least two smaller units/groups seem to be in real danger with a 9 to 3 and 6 to 4 drop in permanent staff.
- Few seem to expect their university managers to care about mathematics or statistics.
- There were several comments about the difficulty of getting statisticians and maintaining courses in statistics.
- A number reported likely restructures. A lack of transparency and information about current and future budgets was also apparent in a surprising number of responses.
- Several noted the difficulty of attracting students to mathematics and statistics.
- Universities not offering a three-year sequence in mathematic and/or statistics tend to have large enrolments in teacher education.

Summary responses to the specific questions are below. Insufficient information was provided for quantitative measures other than for staff numbers. However the lack of progress in implementing the Review recommendations is clear.

**Question 1.** *Please indicate whether you expect some of the additional funding to be passed on during 2008.* Eight indicated yes; for some it was unclear.

*If yes, please indicate the percentage of new funding you are likely to receive.* Only 3–4 indicated significant increases and they all seemed to accept that is was a percentage after the ‘administration’ deduction.

*If no, are there any indications of increased funding after 2008?* There was no optimism that if they had not already got an increase that this situation would change after 2008.

*Any further comments?* Several commented about changing funding allocations and a general sense from these that budgets filtered down eventually but the model could always change.

**Question 2.** *Number of permanent academic staff — ‘normal’ teaching and research only — not full-time research.* On 1 January 2007 there were 596.45 staff. Twelve months later it was 552.95

This has not been broken down into levels but quite a number of the new appointments that were made were at the top end. It is suspected that this was in response to a possible Research Quality Framework (RQF). Thus this decline in staff may reflect an even bigger drop in staff who are prepared to work at the coal face of, for example, service teaching to engineers. A number seemed to be anticipating further appointments during the year but also further retirements.

Some of the non-continuing appointments appeared to be stop-gap measures to cover teaching commitments.

**Question 3.** *In 2008 are you offering more or fewer courses in mathematics and statistics? Please quantify.* Given Q2, it is remarkable that many said the same. About 11 said fewer and about six said more. In general it was a one or two course change. One ‘more’ response was from a department that had about eight fewer staff at the beginning of the year.

**Question 4.** *In 2007 could you offer a three-year sequence leading to a major in mathematics? In 2008?* Two responses were from statistics groups so the sample was 32. Of these six could not offer a three-year sequence in 2007, one of these could in 2008. One responded ‘just’ to both years and another ‘only just’ for 2008. Non-respondents would add to these figures.

**Question 5.** *In 2007 could you offer a three-year sequence leading to a major in statistics? In 2008?* Two responses were from mathematics only teaching departments so the sample was 32. Ten could not offer a three-year sequence in 2007, two said ‘with great difficulty’ and a couple only if supplemented with mathematics courses. One ‘yes’ was a ‘hope so’ for 2008. The difficulty in finding staff was noted by several. Two universities may be affected by the possible break down of shared course arrangements caused by potential staff losses at both of them. Added to the non-respondents, the situation is approaching where only about half the universities can offer a three-year sequence in statistics.

*Any further comments concerning course offerings?* A couple mentioned help from collaborative arrangements such as the AMSI Summer School and the Access Grid network — initiated through AMSI and its International Centre of Excellence for Education in Mathematics (ICE-EM) — and strengthened by a University of Sydney CASR grant.

**Question 6.** *Some other key performance indicators from the Review are listed below. Please comment, where relevant, in regard to your institution, especially in the period 2007–2008.*

- (a) Staff–student ratios improved: Same, worse or slight improvement.
- (b) More tutorials and computer laboratory use: five said ‘yes’, one said ‘worse’ and the rest were the same.
- (c) Number of new continuing appointments: New appointments seemed to be either necessary replacements to maintain programs or at level E. See reference to possible RQF above.
- (d) Number of new non-continuing appointments: Generally seemed to be stop-gap to keep courses running.
- (e) More applications from talented mathematicians and statisticians abroad: If they had advertised, generally ‘yes’, especially for ‘pure’, but not for statistics.
- (f) Student load in mathematics and statistics (quantify if possible): small increases or decreases but nothing noteworthy.

- (g) Increased number of service courses taught in mathematical sciences departments (quantify if possible): a few small increases, most the same. One had biology decrease by 30%.

**Question 7.** *Please attempt to forecast the funding environment for mathematical sciences at your institution in 2009 relative to that for 2008. Will it likely be better, or will it be worse? Only one or two expected improvement, many were quite pessimistic. ‘Same’ was common comment.*

**Anything you would like to add?** (Included here are a number of comments that were scattered throughout or in covering notes.)

- Our institution has made it clear that none of the money is to be used for mathematics.
- At faculty level our full income is reflected. Schools within our faculty are then allocated faculty funds in proportion to their income. The problem lies in our faculty not being allocated a proportionate share of the full university’s income in a similar manner. Our faculty is thus indirectly subsidising other faculties.
- We offer a major in mathematics, with a proper honours program, but only by having staff over-teaching. This has seriously impacted on research output in mathematics, and collaborative research efforts have not been able to be realised.
- Almost no students want to do maths/stats and load only exists in a few compulsory subjects.
- We are extremely concerned about this year’s enrolment and the trend.
- Most education-science students do one introductory course in mathematics and one introductory course in statistics. Mathematics is not emphasised as being important for a science degree.
- Attracting talented staff in statistics particularly difficult.
- Situation better than it has been for years. Have strategic funds to support research, staffing budget up, student numbers up and about to get new building. Supportive new dean arrived three years ago.
- I have given up fighting bureaucracy here. I shall lay down and die or go elsewhere. Perhaps I shall just die. However, given an ounce of encouragement (I do not have even that here), I have been known to bounce back very quickly. When I joined XXX in 1988, as a senior teaching fellow and PhD candidate, the last thing on my mind was that mathematics would not even exist here in 2008! Despite its intrinsic value, with excellent supervisor and highly credible referees, I am now ashamed to even claim my PhD from here.
- XXX is struggling the way many regional universities are struggling — what once was quite a broad offering across disciplines which met the needs of the local region is transforming into a market-driven offering optimised around student demand. There is no mechanism in university policy to prevent the decommissioning of low-enrolment areas of academic endeavour like mathematics. Unless the policy settings at a local and national level are changed, the presence of mathematics in universities at places like XXX will continue to decline. The support of AMSI in this difficult context is much appreciated

— that we add something to the AMSI footprint does, I hope, show that we can work to our mutual benefit.

- In July 2008, we shall be down to two statisticians. It is not hyperbole to suggest that the intention is to remove stats from (a regional university) and have amateurs teach low level service units.
- We have not increased the service teaching we do, but we have strengthened the quality of what we do, and so the threats to remove it from us have disappeared. In this sense, we have improved our service teaching relevance and quality and secured a stronger future for ourselves.

Pre-election part of an email from one Head read:

I am writing in the harsh light of local university budgeting following the initial euphoria over the change at the Federal level to the funding of the mathematical sciences. At XXX University we are nearing the end of the 2008 budget round, and during the last two or three weeks it was becoming apparent that the expected increased weighting for mathematics and statistics had not been incorporated. I went to see Y, the University Director of Policy and Planning, taking my Head of School with me. Y made it quite clear to us that the change at the Federal level was an ill-thought-out policy, done for political reasons, and that there was no obligation on the university to follow suit. (He also related his ‘incredible’ expertise in this area, as a former employee of DEST responsible for the original Relative Funding Model, and his on-going association with that section.) We asked how the Federal Government would view this non-implementation of its policy, and in particular the view of Julie Bishop. Y’s answer to this was that DEST wouldn’t be concerned, and that Julie Bishop wouldn’t get involved in such fine detail. I also suggested that this could be raised with the Vice-Chancellor but we were told that our VC was getting similar submissions from all over the university and would not be at all sympathetic . . . . We left not surprised but nevertheless rather depressed.

### **Final comments**

The results of this questionnaire are extremely disappointing. We believe that there is bipartisan support for improving the mathematical sciences in Australia. The previous government improved core funding. It also provided some funding for AMSI which continues to support collaboration across the mathematical sciences. The current government gives every indication that it is aware of the problems that it has inherited. However urgent action is needed to ensure that government funding for the mathematical sciences is used for what it was intended. And better funding is needed for AMSI to support the collaborative approaches that have sustained so much during this difficult period for mathematics and statistics in Australia.