

## Summary Results — ACHMS Meeting February 2010 Survey

### Background

The questionnaire attached (Appendix 1) was circulated to the Head of Mathematical Sciences at all Australian Universities. It sought to provide a snapshot of how the mathematical sciences were faring in the university sector. Concerns had also been raised on the apparent increase in the use of casual staff and so this was also explored.

Completed questionnaires were received from 32 separate departments. Questionnaires were not returned from Victoria University, University of Southern Queensland, University of Tasmania, Australian Catholic University, Curtin University, University of Canberra, University of Ballarat and ANU Statistics.

### Responses

Over the last 3 years (2007—2009) in your department/school:

1. **Undergraduate M&S subject enrolments\* have**  
16 reported an increase, only one reported a decrease
2. **M&S majors have**  
Of those offering a major 4 reported an increase, 3 a decrease
3. **Honours (or equivalent) student numbers have**  
5 reported an increase, 5 a decrease
4. **Domestic research students numbers have**  
6 reported an increase, 7 a decrease
5. **International research students numbers have**  
11 reported an increase, 2 a decrease
6. **Total research students numbers have**  
10 reported an increase, 4 a decrease
7. **Use of casuals as tutors/demonstrators/markers has**  
20 reported an increase, 2 a decrease
8. **Use of casuals as lecturers has**  
17 reported an increase, 4 a decrease (in 3 of these, continuing staff had increased)
9. **Continuing staff numbers have**  
9 reported an increase, 15 a decrease
10. **Fixed term, research only, staff numbers have**  
8 reported an increase, 2 a decrease
11. **Fixed term teaching staff numbers have**  
4 reported an increase, 1 a decrease
12. **Overall research income from all sources has**  
12 reported an increase, 7 a decrease
13. **I am concerned about the increasing number of casual tutors:** 8 Yes / 21 No / 3 NA
14. **I am concerned about the increasing numbers of casual lecturers:** 15 Yes / 11 No / 6 NA
15. **I have had difficulties finding appropriately qualified casual staff:** 20 Yes / 10 No / 2 NA
16. **Compared to 2009 our 2010 discretionary budget is**  
5 reported an increase, 2 a decrease, 17 about the same,
17. **In 2010 are you offering:**
  - (i) A major in mathematics: Yes 25, No 7
  - (ii) A major in statistics: Yes 15, No 16, ? 1

(iii) A major with a mix of mathematics and statistics Yes 20, No 10, ? 2

### **Comments added by Heads**

**Q1** *Our system makes it difficult to track whether a student actually obtains a mathematics major.*

**Q13** *No. This helps support our honours and PhD students  
No, we need to train students to teach as well*

**Q14** *Yes. But on the positive side, we have been using post docs and have been able to extend their contracts as  
they teach. Also helps their CVs  
No, post docs need lecturing experience*

### **Other Comments**

*'...we have gone from a full-three year mathematics and statistics degree program plus service teaching at the turn of the century to offering only those mathematics courses that core to any non-mathematics university program (this is effectively a small number of service courses...but perhaps it is time to begin again – a new VC has injected a much needed boost to morale...'*

*'We have vacant positions, but were unable to fill some in 2009 due to low quality of applicants'*

*'...we are only allowed to spend our agreed Expenditure, which is \$1.3m less than our income...Maths, Stats and...are now bankrolling the Science Faculty. I have managed for the first time to have 100% continuing lecturing staff'*

*'We have more service teaching in first year due to increases in engineering and aviation enrolments. No new staff...I just keep being told the sessional budget needs to be cut. There seems to be no relationship between student numbers, sessional budget and staff numbers. Last year we taught 160EFTSU with 4 full-time staff.'*

*'Staffing numbers continue to decline, as other disciplines use their non-specialist staff to do their 'maths'. Maths education is terrible in our Ed degree, and all discipline specific staff tend to be excluded... Applied science degree has reintroduced a compulsory maths subject, but it's only high school level. The specific needs of dominant disciplines like engineering help to support the maths standard, but also deny the opportunity to do maths with broader reach than the narrow engineering focus.'*

*'Difficult to find/attract staff to full-time, on-going appointments and statistics remains a major problem...moves to reduce the number of combined/double degrees on offer is adversely impacting on maths majors and hence potentially staffing. Admission of a greater number of inadequately prepared (in maths) students to B.Eng and other degrees has led to a demand (and need) for enhanced tutorial programs in first and higher years but we lack resources (financial and qualified people) to effectively offer this.'*

*'The current and recent situation has been dire...A mathematics regeneration is planned...The new appointments, even if funded, may prove difficult to fill!'*

*'Our School has suffered by a reduction in statistics lecturers (one resignation and one long-term sick leave). It has therefore been challenging to find suitable replacements (both for tutoring duties as well as lecturing).'*

*'In 2009, we had a 45% increase (over 2008 figures) of enrolments, entirely due to service teaching requirements...These numbers produced an increased funding allocation to the Faculty of Science for 2010, none of which was passed to the Department and so we have not been able to make any extra appointments to improve the staffing situation.'*

*'Currently the University has a recruitment pause. Aim to advertise further continuing positions later in 2010.'*

*'The slight increase in budget has not been sufficient to cover the reasonably large increase in enrolments.'*

One Head noted that domestic research student numbers have been stable *'due to lack of scholarship funding'*.

*'We are still experiencing some growth in staffing numbers.'*

*'Research activity in Applied Mathematics continues grow at...and our staff have recently secured significant funding from the government, CSIRO and industry. On the education front, ... is planning to run an Applied Mathematics co-major in its science degree next year and we have also expanded our advanced mathematics offerings to Engineering students (offered as electives).'*

*'We have no maths...'*

*' Mathematics Discipline underwent change management in 2006 reducing the number of FTE staff from 4.5 on-going plus one contract staff to 1.5 on-going and 1 contract staff... now we have 2 ongoing staff and 1 contract staff. At the same time our student numbers started to grow from 78 EFTSUs in 2006 to 142 EFTSUs in 2009...Because of the staffing situation, 3 of the first year classes were taught by casuals, increasing the coordination load on the few full time mathematicians. Tutors were recruited from postgraduate students, but as we do not have very many of them, this puts also pressure on things...In 2010, our Head of School has decided to change the way units are taught to effectively abolish tutorials in first year classes in favour of larger workshop-type classes... In addition there has been a decree to reduce the number of lecture hours in the subjects from 3 to 2. There is no money for marking in this model, leading to the lecturers having to do all the marking themselves ... The effect is a severe intensification of work with student staff ratios of well over 100. I have two young colleagues who are hardest hit in that they have only been in their jobs for less than 2 years, so not only have they got to cope with high teaching loads, but also with unit development and the need to establish a research niche. All in all, a very bad position to be in.'*

*'I am the sole remaining statistician and am over 60. I am expected to teach 10 units/year to encompass STAT100 (a glorified high school unit) and MSc... (A regional University) has accepted OS students and now finds that these students want to study maths. This does not translate to new appointments. There is no lessening in the demand for statistics at all levels.'*

*'I coordinate and teach six courses a year. For three years I have pushed for another maths lecturer as my workload is too high...I am continually told that we do not have the resources to appoint another lecturer, but I seriously doubt this, considering that enrolment numbers are very high. There is absolutely no move to appoint another lecturer. The main statistics lecturer left last year...we train maths-teachers, engineers and scientists!'*

*'While it is somewhat positive that we have not lost further ground locally during the survey period, this is coming off a preceding period in which there had been substantial attrition in staffing and funding.'*

### **Comments – Jan Thomas**

Two years ago a questionnaire was sent 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 in the Strategic Review (2006) that were linked to this funding. I noted at the time that *'the lack of progress in implementing the Review recommendations is clear.'*

In 2008 there were 34 responses and this year it was 32. It is clear that in 2010 the majority of Departments have a greater student load with the same or less on-going staff. The on-going lack of progress in implementing the Review continues.

This is possibly one reason why the issue of casual staff was raised during 2009 and addressed in the 2010 survey. It would be wonderful if it was possible to extract concrete data on student numbers, staffing etc and some of us have tried. I believe what we do have from both 2008 and 2010 is evidence of continued decline with the exception of a handful of departments.

In regard to the use of casuals, the current issue of Australian Universities Review has a useful article on casual employment in higher education (see <http://www.aur.org.au/>). The authors conclude:

*The realities of the labour market where employers use casual employment as a cost-saving*

*measure undermine the argument that casual employees gain flexibility and work/life balance and suggest that they are jobs rather than careers. A major outcome for people in long term casual employment is frustrated careers.*

Relating this to the survey, few Heads were concerned about the use of casuals for tutoring as it provides income and experience for their post-graduate students. However once these students want careers, their on-going appointment as casuals probably does become a matter for concern. And if they are in high-demand areas they will not stay in casual employment in the universities if they can get career positions elsewhere. Hence the concern about finding appropriately qualified casual staff. Most mathematical sciences graduates with higher degrees have other options. They will go to other employment or overseas if on-going positions are not available in Australian universities. At the same time it is clear the mathematical sciences departments are under-staffed and many more positions should be available.

Nowhere is this more apparent than in the number of universities that cannot offer majors. The 2008 and 2010 figures cannot be compared directly as in 2008 a question regarding a major that was a mix of mathematics and statistics was not asked. However, it would appear that there has been small decrease in the number of universities offering a major in mathematics and a larger drop in those offering a major in statistics.

Given the importance of statistics and many areas of mathematics to the research capability of any university, it must be concluded that their capability is less than optimal and declining. As is the readiness for research degrees of many graduates who are getting less than optimal mathematical and statistical preparation from understaffed and poorly supported mathematical sciences departments.

One final comment, the opportunity to complete a PhD in a strong department has become concentrated in a few institutions. To quote Barlow from his review of research in Australian universities (2009)<sup>1</sup>:

*Investment in mathematical sciences R&D appears to have tracked with growth in the university sector as a whole over the past decade. But investment growth has also become increasingly concentrated, with a diminishing number of institutions active in the field. Four institutions now account over half of all Australian university R&D expenditures in mathematics and statistics and for nearly two thirds of national competitive grant income in the field. At the same time, research in mathematics and statistics is essentially non-existent in around half of all Australian universities.*

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<sup>1</sup> Personal communication

**ACHMS Meeting February 2010 – Survey** (Appendix 1)

Name:

Department/School:

Institution:

Please circle your response.

Over the last 3 years (2007—2009) in your department/school:

18. Undergraduate M&S subject enrolments\* have  
Increased / decreased / been stable / don't know
19. M&S majors have  
Increased / decreased / been stable / don't know / NA
20. Honours (or equivalent) student numbers have  
Increased / decreased / been stable / don't know / NA
21. Domestic research students numbers have  
Increased / decreased / been stable / don't know / NA
22. International research students numbers have  
Increased / decreased / been stable / don't know / NA
23. Total research students numbers have  
Increased / decreased / been stable / don't know / NA
24. Use of casuals as tutors/demonstrators/markers has  
Increased / decreased / been stable / don't know / NA
25. Use of casuals as lecturers has  
Increased / decreased / been stable / don't know / NA
26. Continuing staff numbers have  
Increased / decreased / been stable / don't know
27. Fixed term, research only, staff numbers have  
Increased / decreased / been stable / don't know / NA
28. Fixed term teaching staff numbers have  
Increased / decreased / been stable / don't know / NA
29. Overall research income from all sources has  
Increased / decreased / been stable / don't know / NA
30. I am concerned about the increasing number of casual tutors: Yes / No / NA
31. I am concerned about the increasing numbers of casual lecturers: Yes / No / NA
32. I have had difficulties finding appropriately qualified casual staff: Yes / No / NA
33. Compared to 2009 our 2010 discretionary budget is bigger / smaller / about the same / NA
34. In 2010 are you offering:
- (iv) A major in mathematics: Yes / No
  - (v) A major in statistics: Yes / No
  - (vi) A major with a mix of mathematics and statistics: Yes / No

Other comments about the staffing situation in your department/school? Use the reverse side.

\* across all degree enrolments and including service subjects