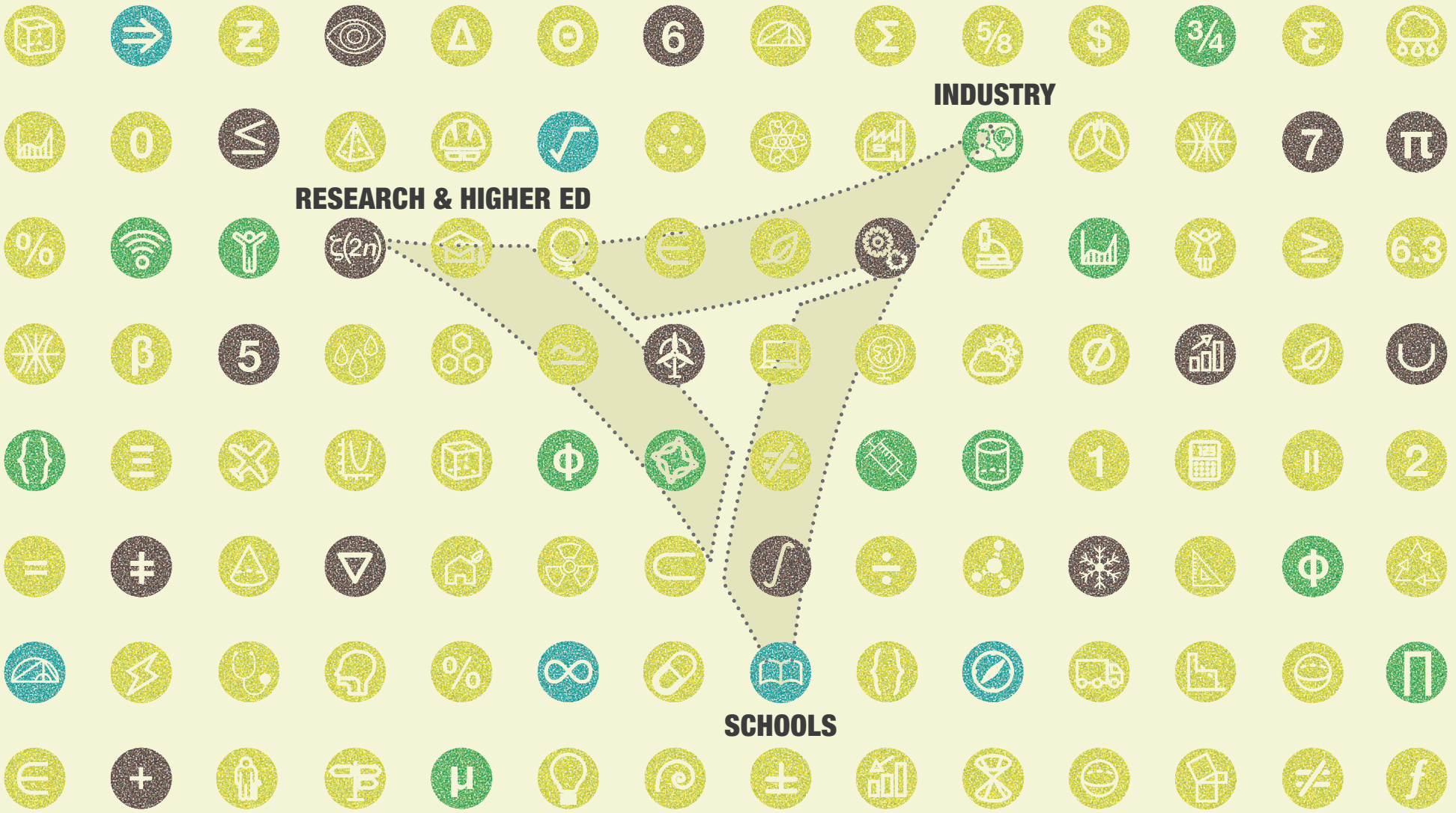
AMSI SURVEY 2015 FINAL RESULTS



AMSI AUSTRALIAN MATHEMATICAL SCIENCES INSTITUTE

Contents

INTRODUCTION

In August 2015, departments and schools of mathematics and statistics at Australian universities were sent a questionnaire about their staffing, teaching, research and student numbers in 2015. This was the fourth survey of its kind, with the aim to gather longitudinal data on research and higher education in the mathematical sciences. The annual survey complements other data gathering efforts and attempts to fill gaps in our knowledge of the state of mathematical sciences (which include mathematics and statistics) in Australia.

In its initial year, the survey was sent to AMSI's member universities only, however in all subsequent surveys the invitation to participate has been extended to non-member universities. In the first survey, held in 2012, 27 departments and schools from 25 AMSI member universities participated. In the 2013 survey, the number of participants increased to 33 departments from 32 universities. In 2014, the participation dropped to 25 departments from 24 universities. In 2015, we have received data from 30 departments or schools from 28 universities. Macquarie University has separate departments for Mathematics and Statistics which respond to the survey separately. We also receive separate data from the Australian Defence Force Academy in Canberra which is part of the University of New South Wales.

The survey questionnaire is quite comprehensive, and survey responses are often submitted with incomplete data – the response rate per topic is therefore variable. Below is the survey response in 2015 (grouped by university network) from all universities which have submitted either complete or partially complete survey responses.

Table 1. 2015 Survey response by university network

Network	Number of institutions invited to participate	Number of universities responding in 2015
Australian Technology Network	5	5
Group of Eight Universities	8	7
Innovative Research Universities	6	5
Regional Universities Network	6	4
Unaligned	14	7
Total	**39**	**28**

As the 2012 survey collected data from 2 years (2011 and 2012), a picture is now starting to emerge for the period 2011 to 2015. We are gaining a more comprehensive view of the state of mathematics and statistics in universities in Australia, even though it is still too early to draw firm conclusions on trends. AMSI aims to keep building on its data collection in order to obtain a longitudinal view of trends and developments.

The survey responses presented in this document are grouped – as much as possible - by existing university alignments: Group of Eight (Go8), Australian Technology Network (ATN), Regional Universities

Network (RUN), Innovative Research Universities (IRU) and 'unaligned' universities.

A list of universities participating in the 2015 survey is contained at the back of this document in the Appendix. AMSI wishes to thank all participants for their generous cooperation.

Geoff Prince

AMSI Director

Author: Maaike Wienk

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Please note that rounding may have produced totals greater than 100%

SUMMARY OF FINDINGS

The 2015 survey responses build on the data collected in the previous years and mostly confirm the possible trends and developments identified earlier:

- The number of academic staff in the mathematical and statistical sciences at universities is possibly on the rise again after being hard hit in the last two decades, but the picture is uneven. The average number of staff per department has not changed over the past five years (the dip in 2013 was caused by a larger participation of "small" departments with few staff members). However, the total number of staff in the 14 departments for which we have data from 2011 to 2015 rose by 63 FTE between 2011 and 2014, before levelling off in 2015 at 497 FTE (still an increase of 47 FTE compared to 2011). If we compare staff numbers in these 14 university departments, nine departments had more staff in 2015 than in 2011, four departments had fewer staff, and one the same number of staff measured in FTE. The increase in "Research only" staff between 2011 and 2014 has levelled off in 2015. "Teaching and Research" staff have seen a small increase in 2015.

- The academic workforce in the mathematical sciences remains predominantly male, and the proportion of females reduces with the level of seniority. In 2015, about 33% of reported casual staff was female, which increased to 36% at level A, decreased to 27% at level B, and 24% at level C. This dropped significantly to 17% at level D and 8% at level E. It is important to remember that these data only provide a snapshot and the proportions fluctuate slightly from year to year (also depending on the mix of participating universities). Because of this, we isolated the departments which have participated in all AMSI surveys to date to see if any change in gender balance has taken place at these 14 universities – and it appears not. Among these universities, the only area where the **proportion** of females has substantially increased is in level A positions. Unfortunately, this is not due to an increase in female staff numbers, but to a drop in the **number** of level A positions which were filled by male staff members. Over the period 2013 to 2015 the pattern of decreasing female participation with increasing seniority has remained constant. Longitudinal data collection is required to adequately assess developments of the female proportion of mathematical staff as careers progress.

- With regard to staff profile, at the entry level (level A) staff numbers are lower than level B and mostly concentrated at Go8 universities. The staff profile remains very heavy at the top, with level E staff outnumbering level D. At Go8 universities, level E staff outnumber level C and D staff.

- Casual staff perform the majority of tutorial teaching (67%). The proportion of lecture teaching by casuals remained virtually the same as in 2014 – 11% against 12% in 2014, and 9% in 2012 and in 2013.

- The most prevalent major offered in 2015 was in Applied Mathematics, which was offered by 52% of all surveyed universities. Second most prevalent was a major in Statistics (48%), followed by a combined major stream in Mathematics and Statistics (44%). Of the 27 departments providing data for this survey question, all reported offering at least one major in the mathematical and statistical sciences. We know from other sources and earlier surveys that small departments in non-AMSI member universities are often not in a position to offer a major. None of these universities were part of the survey in 2015.
- Engineering, Physical Sciences and Computer Science remained the top areas of service teaching. Biological Sciences followed closely behind and Education was in fifth place.
- For some departments reliable data on undergraduate student numbers are hard to obtain, and in general these data can be quite volatile from year to year. With this in mind, it seems that average enrolment data overall have been quite constant, however with a widening gap between Go8 and other universities in 2015 in first year numbers. There certainly appears to have been no decline in numbers of undergraduate students overall and especially first year numbers, but this is one area where yearly data collection is vital to better understanding of what is happening over the longer term.
- In general, departments have fairly easy access to accurate figures for higher degree enrolments. The overall average enrolment in higher degrees has remained constant over the five-year period.
- Among undergraduate students, the proportion of male domestic students, after remaining very constant around 55-57% between 2012 and 2014, dropped slightly to 50% in 2015. The proportion of international (mostly male) students increased to 24%, up from 17%. The proportion of female domestic students remained the same. However, since quite a few departments were not able to obtain gender and domestic/international break downs for their undergraduate population, caution is warranted.
- The profile breakdowns for higher degree student populations have been much easier to obtain. With regard to the Honours student population, overall the proportional breakdown has been quite constant. However, at Go8 universities the proportion of female Honours students has declined considerably in favour of male (domestic) students, while at other universities things seem to be going in the other direction. Similarly, the PhD enrolment breakdown seems constant when looking at all universities taken together, but at Go8 universities the male proportion has been on the rise, while at other universities the female proportion has been going up. It is also worth noting that a very significant portion of female PhD students are coming from overseas and the domestic enrolment of PhD students has been stagnant. This confirms anecdotal reports.

- The commencement and completion numbers on Honours, Masters by Coursework, Masters by Research and PhD, broken down by gender and domestic/international status for the years 2013-2015 have all been included in this document. These numbers are quite volatile and more years of data collection will be required to be able to discern any trend.
- The higher degree completion numbers by field of study in 2015 highlight differences in emphasis on Pure Mathematics, Applied Mathematics and Statistics in the different types of degrees, however this changes significantly from year to year.
- The research data again show that research funding and activity is very much skewed towards Group of Eight universities; they are by far the most successful at securing ARC funding, are the most significant recipients of Commonwealth research funding in general, and as a consequence the most important employers of ARC funded research staff – mostly at levels A and B.
- In the period 2012-2015 the number of students identifying as Aboriginal and/or Torres Strait islander has fluctuated wildly. It is not clear whether this is due to reporting by the students or by the departments participating in the survey, or both. Note the increase of staff in mathematics and statistics departments identifying as Aboriginal and/or Torres Strait islander, from 1 in 2012 to 3 in 2015.
- The individual replies by universities on their gender, socio-economic and indigenous policies have been supplied on an identifiable basis, as this information is normally publicly available and supplied for the benefit of the AMSI community.

ACADEMIC STAFF NUMBERS

Table 2. Average number of mathematical sciences staff per university (in FTE)

	2011	2012	2013	2014	2015
Go8 universities	52	53	61	62	62
ATN universities	25	25	29	32	33
IRU universities	15	18	13	13	11
RUN universities	13	12	9	11	10
Unaligned universities	19	21	9	15	21
All universities	29	30	24	30	29

The lower average in 2013 is caused by the higher response rate among small universities.

Figure 1. Average number of mathematical sciences staff per university (in FTE)

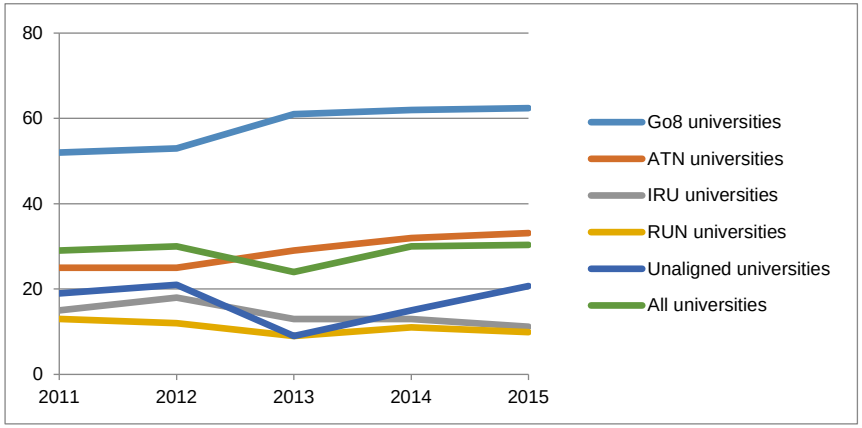
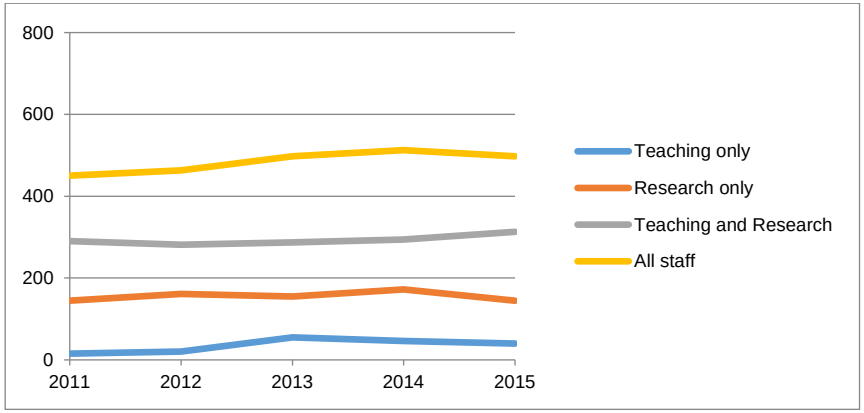


Table 3. Number of academic mathematical sciences staff at universities which delivered staff numbers for AMSI Surveys 2011-2015 (in FTE) (N=14)

	2011	2012	2013	2014	2015
Teaching only	15	20	55	46	40
Research only	145	161	155	172	145
Teaching and Research	290	282	287	294	313
All staff	450	463	497	513	497

14 universities participated in all surveys so far: nine reported an increase compared to 2011, four a decrease, one stayed the same.

Figure 2. Number of academic mathematical sciences staff at universities which delivered staff numbers for AMSI Surveys 2011-2015 (in FTE) (N=14)



STAFF PROFILE

Table 4. Number of academic staff in the mathematical and statistical sciences by employment level in 2015 (actual numbers) (N=27)

	Level A	Level B	Level C	Level D	Level E
Go8 universities (7/8)*	92	103	82	64	87
ATN universities (4/5)	13	43	30	19	25
RUN universities (4/6)	5	17	13	8	4
IRU universities (5/6)	6	19	13	10	4
Unaligned universities (7/14)	22	50	39	21	26

*Numbers in brackets indicate how many of the universities in the network have responded to the survey question.

Figure 3. Number of academic staff in the mathematical and statistical sciences by employment level in 2015 (actual numbers) (N=27)

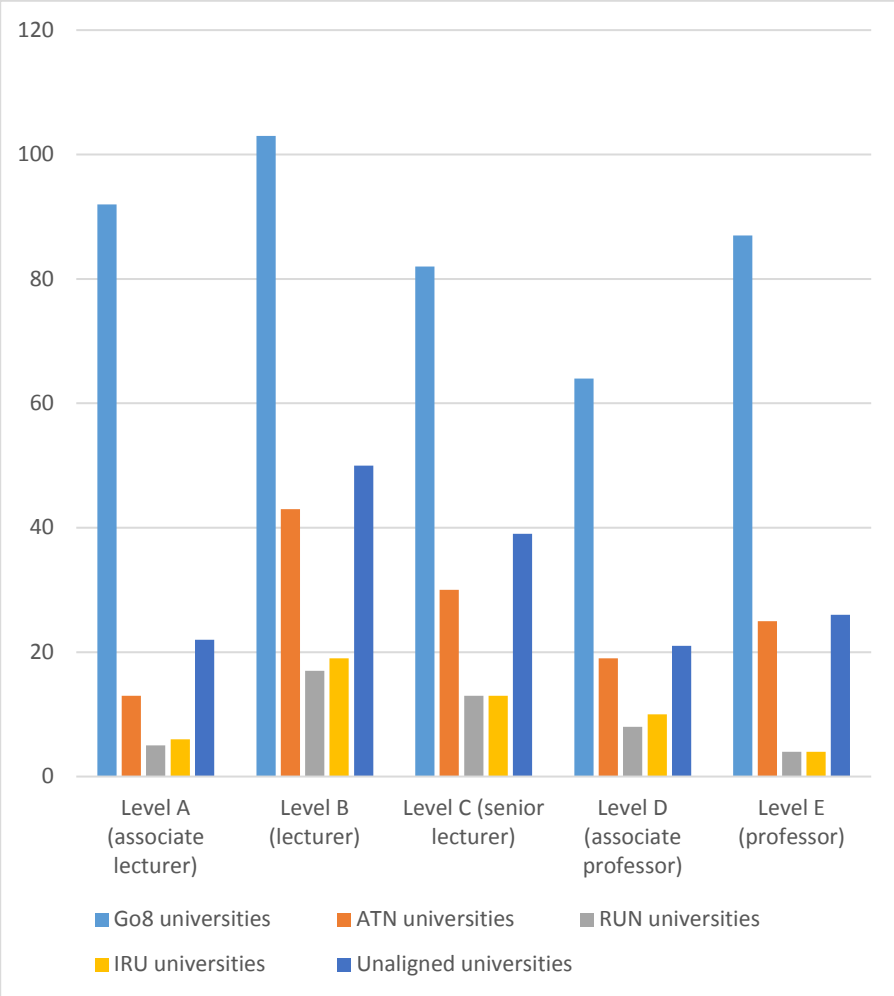


Table 5. Proportion of academic staff in the mathematical and statistical sciences by employment level in 2015 (not FTE) (actual numbers) (N=27)

	Level A %	Level B %	Level C %	Level D %	Level E %
Go8 universities	21	24	19	15	20
ATN universities	10	33	23	15	19
RUN universities	11	36	28	17	9
IRU universities	13	37	25	19	8
Unaligned universities	14	32	25	13	16

Figure 4. Proportion of academic staff in the mathematical and statistical sciences by employment level in 2015 (not FTE) (actual numbers) (N=27)

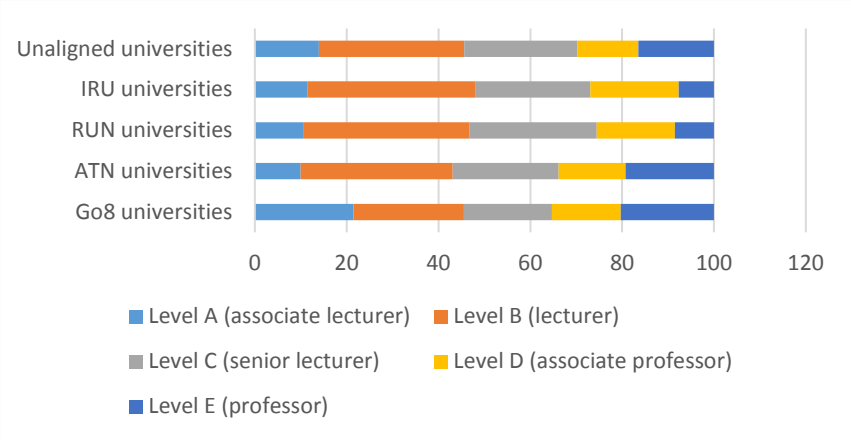


Table 6. Academic staff in the mathematical and statistical sciences by type of employment and employment level (actual numbers) in 2015 - all universities (N=27)

	Level A	Level B	Level C	Level D	Level E
Continuing	19	143	149	114	131
Contract	119	89	28	8	15
Total	138	232	177	122	146

Figure 5. Academic staff in the mathematical and statistical sciences by type of employment and employment level (actual numbers) in 2015 - all universities (N=27)

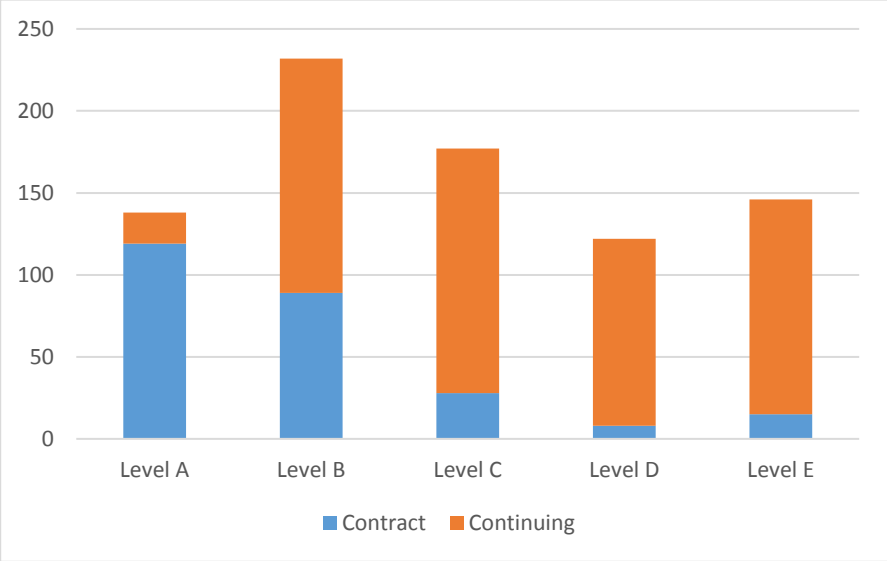


Table 7. Academic staff in the mathematical and statistical sciences by gender and employment level (actual numbers) in 2015 - all universities (N=27)

	Casual	Level A	Level B	Level C	Level D	Level E	Total
Male	620	75	151	121	90	113	1170
Female	300	43	56	38	19	10	466
% Female	32.6	36.4	27.1	23.9	17.4	8.1	28.5

Figure 6. Academic staff in the mathematical and statistical sciences by gender and employment level (actual numbers) in 2015 - all universities (N=27)

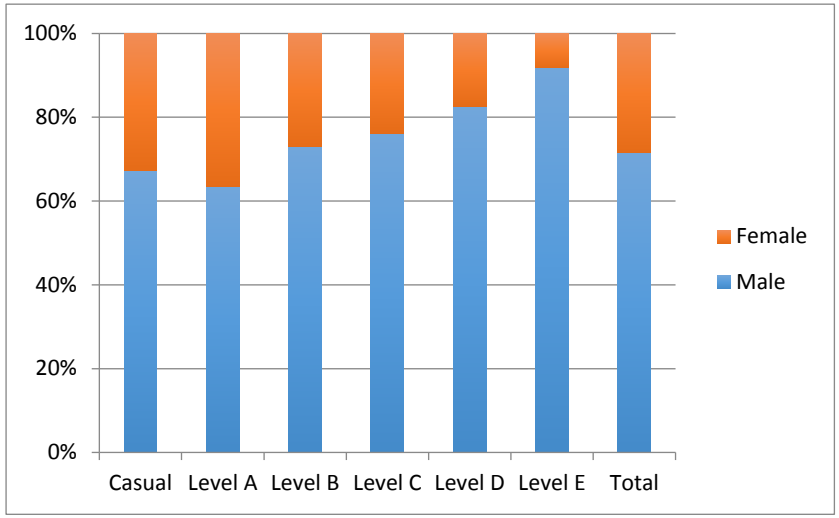


Table 8. Proportion of female staff in the mathematical and statistical sciences by employment level 2013-2015 (actual numbers) (N=27)

	Casual	Level A	Level B	Level C	Level D	Level E
2013	30.5	24.2	22.7	27.2	13.2	9.5
2014	32.5	29.4	30.6	24.7	18.8	9.4
2015	32.6	36.4	27.1	23.9	17.4	8.1

Figure 7. Proportion of female staff in the mathematical and statistical sciences by employment level 2013-2015 (actual numbers) (N=27)

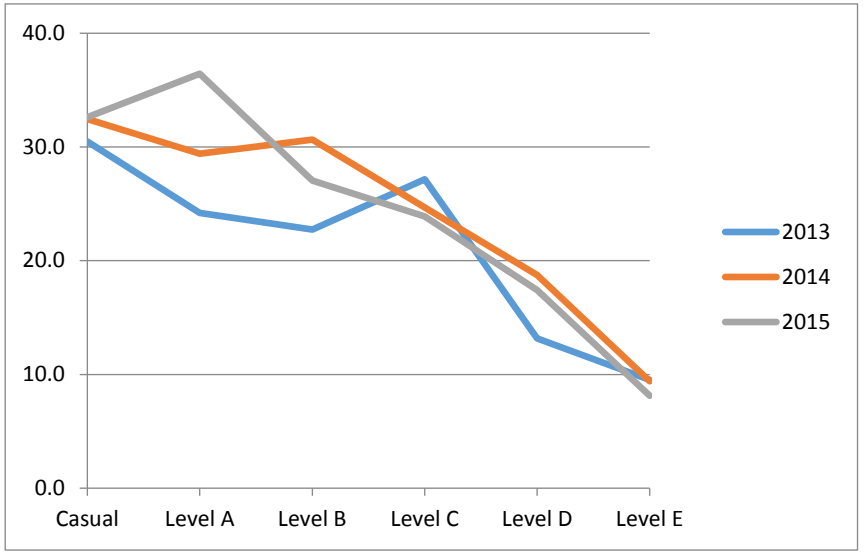
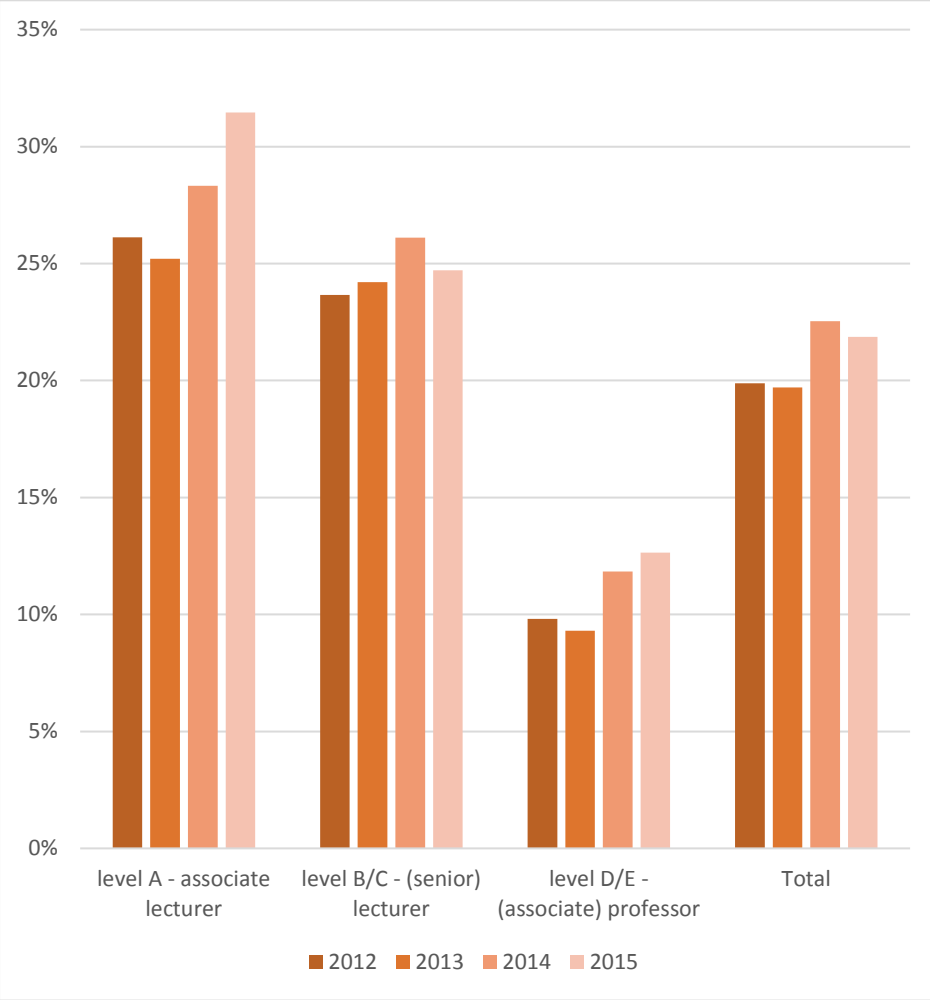
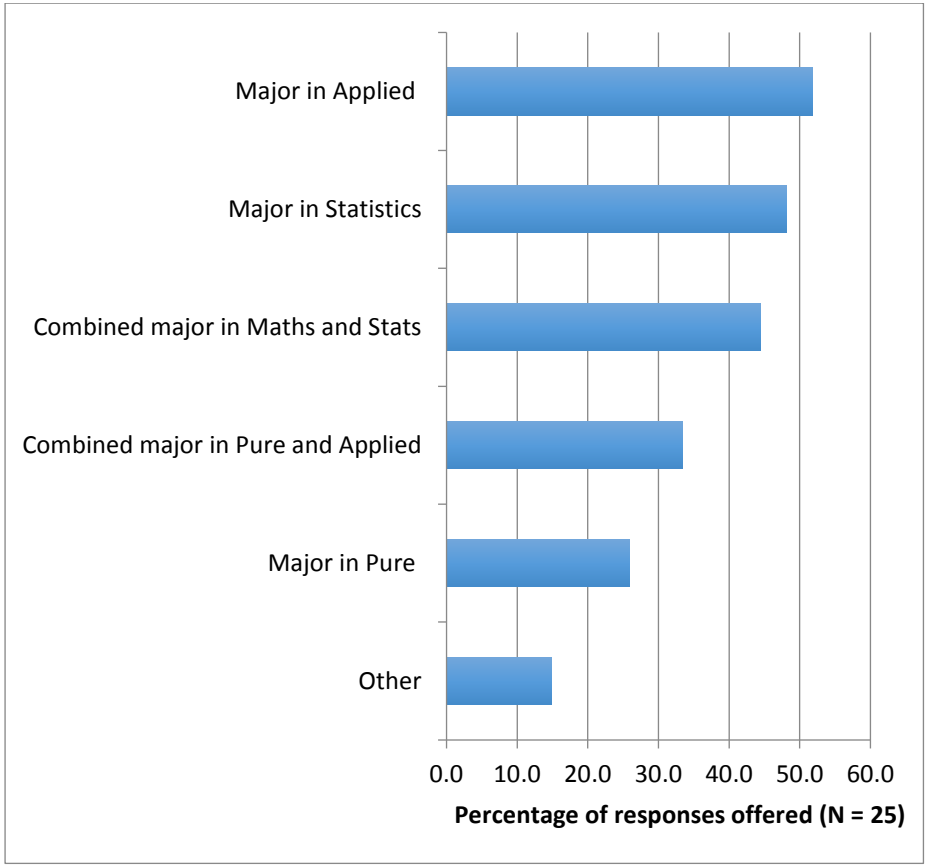


Figure 8. Proportion of female staff by gender and employment at mathematical sciences departments which delivered staff numbers for AMSI Surveys 2011-2015 (actual numbers) (N=14)



TEACHING

Figure 9. Majors in the mathematical sciences offered in 2015 (N=25)



Other Majors offered: Decision Sciences, Oceanography, Quantitative Risk, Actuarial Science.

Table 9. The number of different majors in the mathematical sciences offered at each university in 2015 (N=25)

Number of major types offered in 2015	Number of universities
1	7
2	9
3	5
4	1
5	3

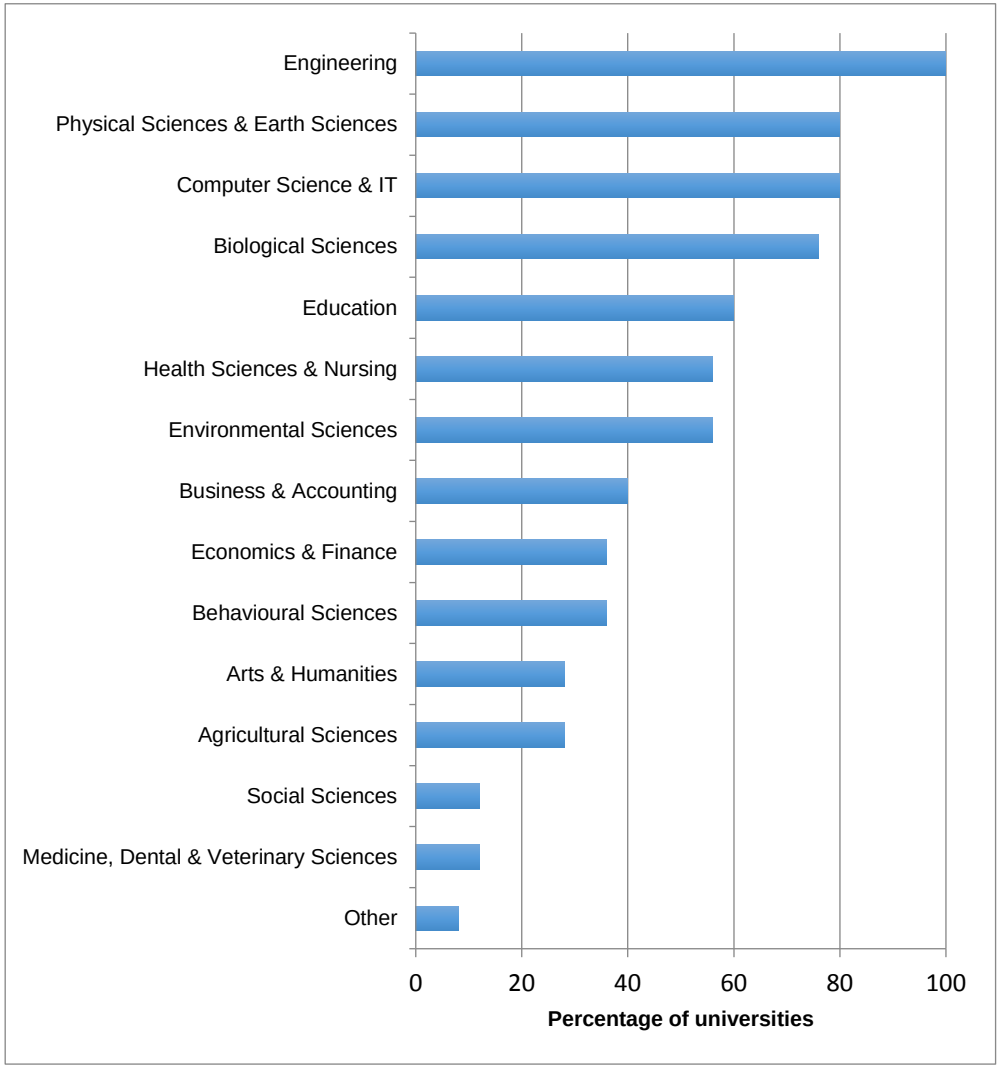
Table 10. Weekly teaching load per mathematical sciences department or school in 2015 (N=23)

	All staff	Casual staff only	Average percentage completed by casual staff
Average Lecture hours per week	70	6	11%
Average Tutorial hours per week	126	89	67%

Table 11. Service teaching in the mathematical sciences by discipline area in 2015 (N=25)

Service Teaching offered to area	Number of universities	Percentage of responses
Agricultural Sciences	7	28
Arts & Humanities	7	28
Behavioural Sciences	9	36
Biological Sciences	19	76
Business & Accounting	10	40
Computer Science & IT	20	80
Economics & Finance	9	36
Education	15	60
Engineering	25	100
Environmental Sciences	14	56
Health Sciences & Nursing	14	56
Medicine, Dental & Veterinary Sciences	3	12
Physical Sciences & Earth Sciences	20	80
Social Sciences	3	12
Other	2	8

Figure 10. Service teaching in the mathematical sciences by discipline area in 2015 (N = 25)



UNDERGRADUATE STUDENT ENROLMENTS

Table 12. Undergraduate enrolments in the mathematical sciences (in EFTSL) in 2015

	1st year (N=18)	2nd year (N=18)	3rd year (N=23)
Go8 Total	5354	1645	601
ATN, IRU, RUN, Unaligned Total	3242	670	581
Total	8596	2315	1182

Figure 11. Average number of 1st year enrolments in the mathematical sciences per university (EFTSL)

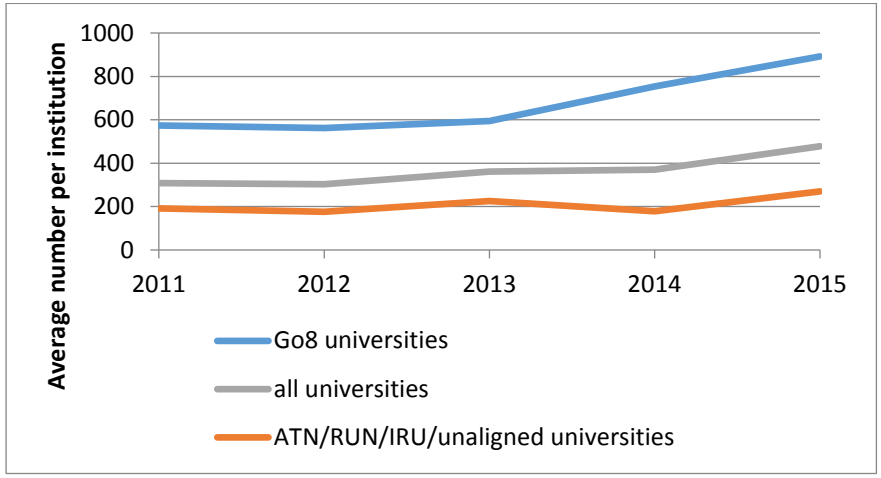


Figure 12. Average number of 2nd year enrolments in the mathematical sciences per university (EFTSL)

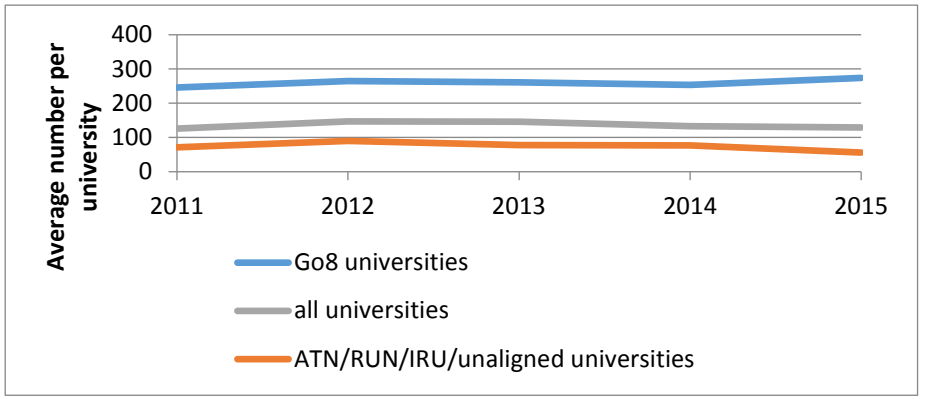


Figure 13. Average number of 3rd year enrolments in the mathematical sciences per university (EFTSL)

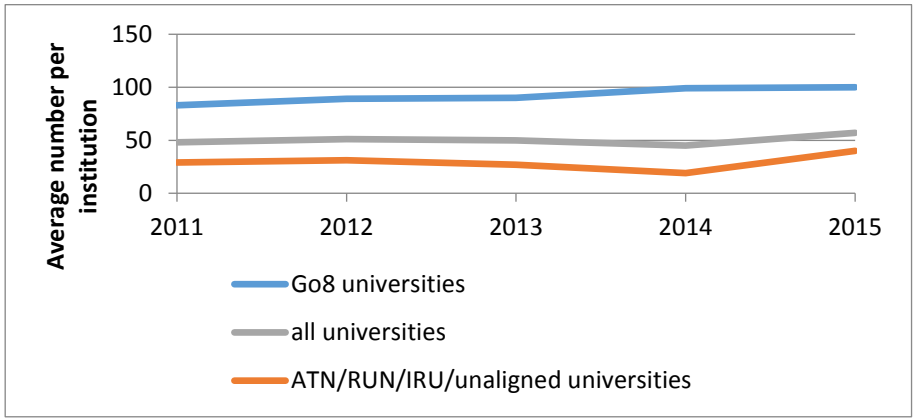


Table 13. Average number of undergraduate enrolments in the mathematical sciences per university (in EFTSL)

	2011	2012	2013	2014	2015
1st year					
Go8 universities	573	562	594	754	892
ATN/RUN/IRU/unaligned universities	192	176	225	178	270
all universities	308	303	361	370	478
2nd year					
Go8 universities	246	265	261	254	274
ATN/RUN/IRU/unaligned universities	71	90	78	77	56
all universities	126	147	146	133	129
3rd year					
Go8 universities	83	89	90	99	100
ATN/RUN/IRU/unaligned universities	29	31	27	19	34
all universities	48	51	50	45	51

Table 14. Progression rates for the 2011, 2012 and 2013 cohorts in the mathematical sciences

	Average student numbers in first year	Progression from first to second year	Progression from second to third year	Retention first to third year
Cohort				
2011-2012-2013	308	48%	34%	16%
2012-2013-2014	303	48%	31%	15%
2013-2014-2015	361	37%	38%	14%

HONOURS AND HIGHER DEGREE ENROLMENTS

Table 15. Total enrolments in the mathematical sciences by degrees in 2015 (EFTSL) (N=23)

	Honours	Masters by Coursework	Masters by Research	PhD
Total Go8 (7/8)*	89	169	18	296
Total ATN (3/5)	29	87	9	94
Total RUN (4/6)	4	6	3	23
Total IRU (4/6)	13	13	1	34
Total Unaligned (5/14)	14	50	9	75
Total All	149	324	40	521

*Numbers in brackets indicate how many of the universities in the network have responded to the survey question.

Table 16. Average number of enrolments in the mathematical sciences by degrees (EFTSL)

	2011	2012	2013	2014	2015
Honours					
Go8 universities	15	14	13	15	15
ATN universities	5	5	5	3	10
RUN universities	<1	<1	5	1	1
IRU universities	5	6	3	3	3
Unaligned universities	2	3	3	2	3
All universities	7	7	6	6	7

Table 16 continued

	2011	2012	2013	2014	2015
Masters by Coursework					
Go8 universities	20	19	16	20	24
ATN universities	25	32	53	6	29
RUN universities	1	<1	2	4	2
IRU universities	2	3	1	2	4
Unaligned universities	7	6	4	2	10
All universities	12	13	14	8	15
Masters by Research					
Go8 universities	5	4	4	6	3
ATN universities	2	2	2	2	3
RUN universities	0	<1	0	0	1
IRU universities	2	2	1	<1	<1
Unaligned universities	1	1	1	<1	2
All universities	2	2	2	2	2
PhD					
Go8 universities	36	38	37	45	42
ATN universities	26	29	24	26	31
RUN universities	9	7	6	1	6
IRU universities	7	11	10	9	9
Unaligned universities	15	14	9	8	15
All universities	21	23	18	21	23

STUDENT PROFILES

Table 17. Undergraduate student profile in the mathematical sciences by gender and domestic/international status

		Male Dom. %	Male Intern. %	Female Dom. %	Female Intern. %	Dom. M&F %
Go8 universities	2012	56	11	26	6	82
	2013	57	12	24	7	81
	2014	55	12	25	7	80
	2015	52	15	24	9	76
ATN/RUN/ IRU/Unaligned	2012	52	10	31	8	83
	2013	57	14	25	4	82
	2014	60	7	31	2	91
	2015	44	20	32	5	76
All universities	2012	55	11	27	7	82
	2013	57	13	24	6	81
	2014	56	11	26	6	82
	2015	50	16	26	8	76

Figure 14. Undergraduate student profile in the mathematical sciences by gender and domestic/international status (All universities)

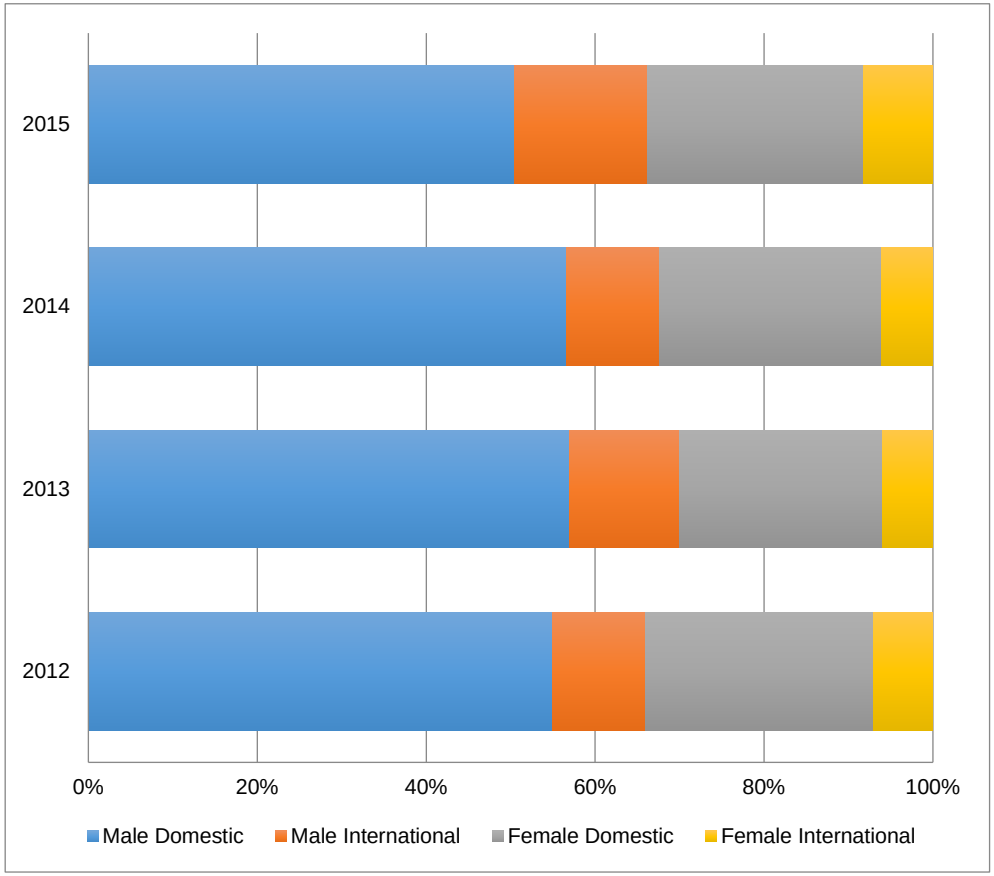


Figure 15. Undergraduate student profile in the mathematical sciences by gender and domestic/international status (Go8 universities)

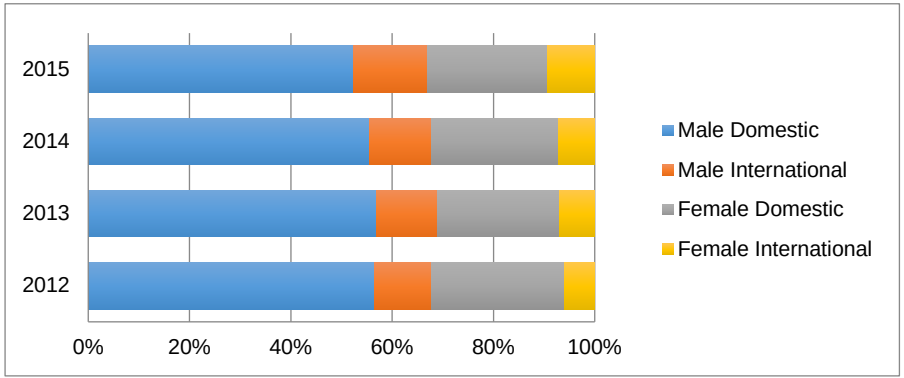


Figure 16. Undergraduate student profile in the mathematical sciences by gender and domestic/international status (ATN/RUN/IRU/unaligned universities)

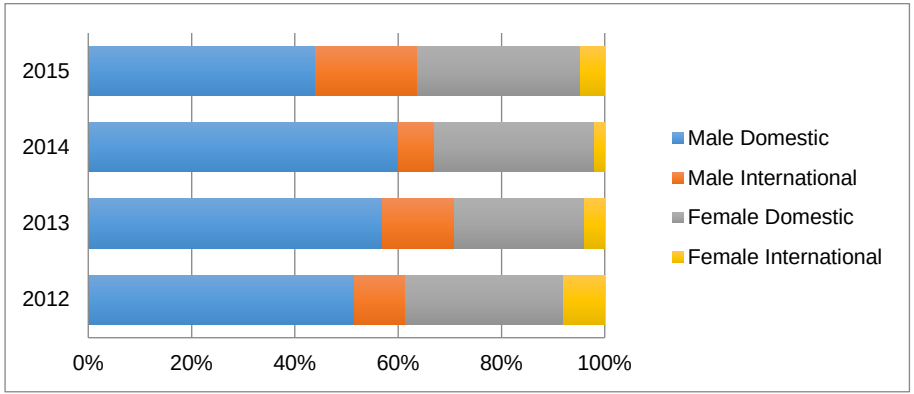


Table 18. Honours student profile in the mathematical sciences by gender and domestic/international status

		Male Dom. %	Male Intern. %	Female Dom. %	Female Intern. %	Dom. M&F %
Go8 universities	2012	60	7	29	4	89
	2013	71	3	23	3	94
	2014	78	6	15	1	93
	2015	77	4	18	1	95
ATN/RUN/IRU/Unaligned	2012	73	3	22	2	95
	2013	66	7	26	1	92
	2014	58	11	29	2	87
	2015	55	9	28	8	83
All universities	2012	69	4	24	3	93
	2013	69	5	24	2	93
	2014	70	8	21	1	91
	2015	69	6	22	3	91

Figure 17. Honours student profile in the mathematical sciences by gender and domestic/international status (All universities)

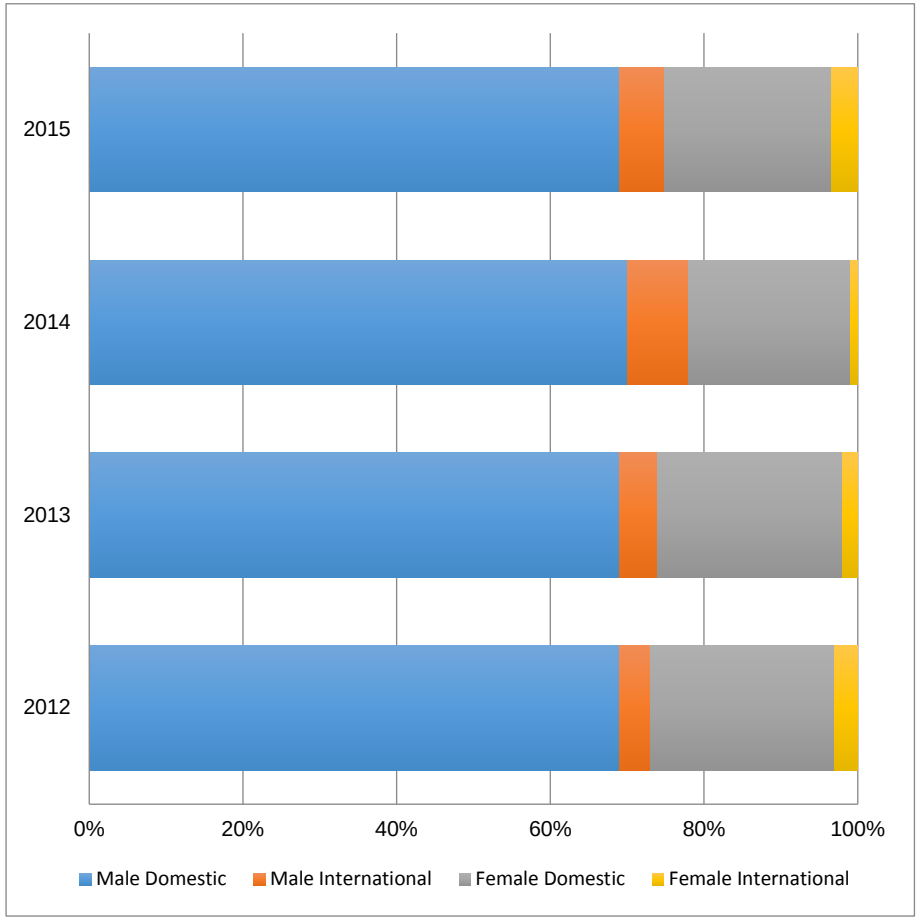


Figure 18. Honours student profile in the mathematical sciences by gender and domestic/international status (Go8 universities)

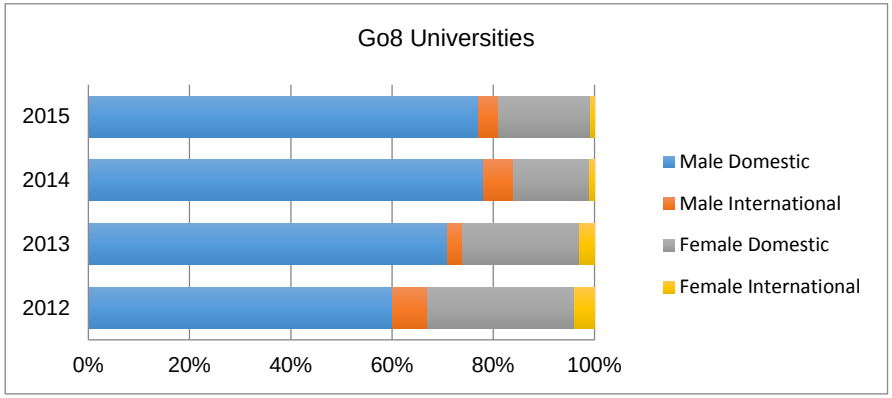


Figure 19. Honours student profile in the mathematical sciences by gender and domestic/international status (ATN/RUN/IRU/unaligned)

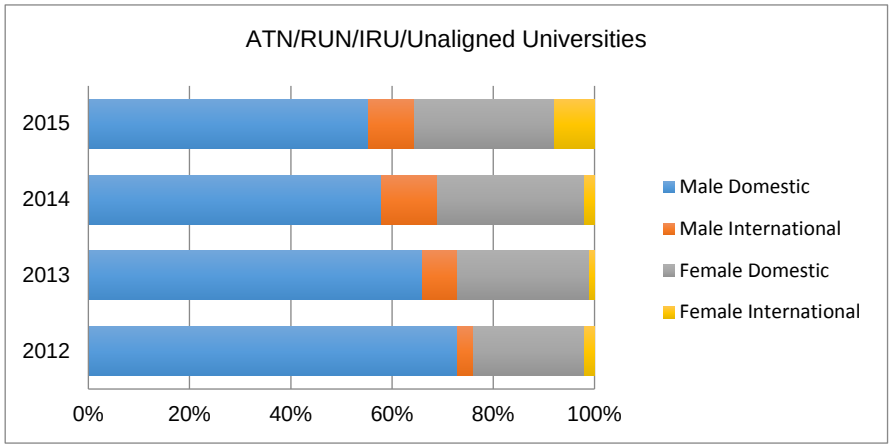


Table 19. Masters by Coursework student profile in the mathematical sciences by gender and domestic/international status

		Male Dom. %	Male Intern. %	Female Dom. %	Female Intern. %	Dom. M&F %
Go8 universities	2012	46	27	13	14	59
	2013	47	23	15	15	62
	2014	39	36	3	21	42
	2015	47	21	10	21	57
ATN/RUN/IRU/Unaligned	2012	42	23	22	13	64
	2013	37	22	25	15	62
	2014	40	28	16	17	56
	2015	46	23	19	13	65
All universities	2012	43	24	19	14	62
	2013	43	23	20	15	63
	2014	39	35	6	20	45
	2015	47	22	12	19	59

Figure 20. Masters by Coursework student profile in the mathematical sciences by gender and domestic/international status (All universities)

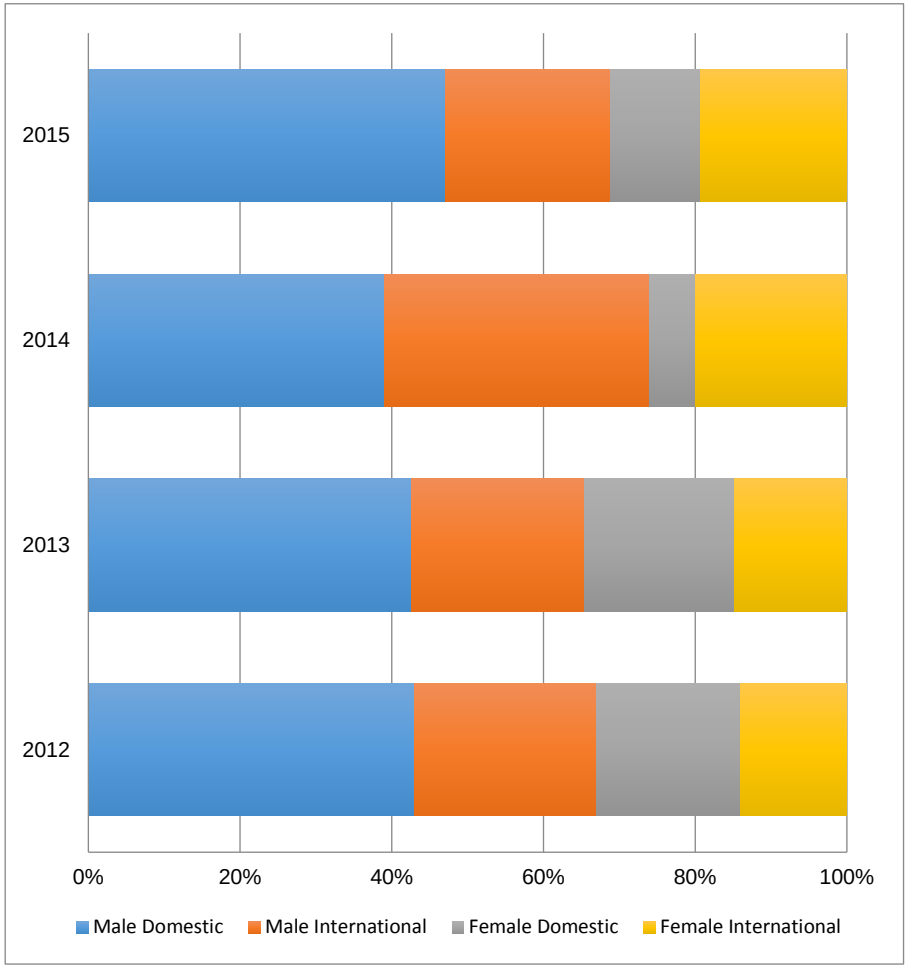


Figure 21. Masters by Coursework student profile in the mathematical sciences by gender and domestic/international status (Go8 universities)

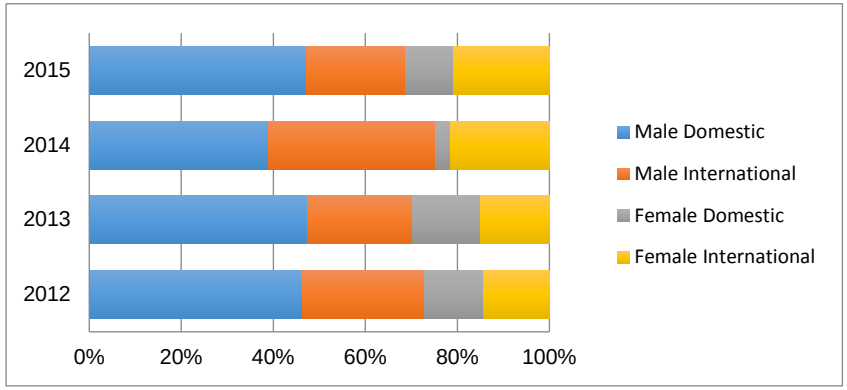


Figure 22. Masters by Coursework student profile in the mathematical sciences by gender and domestic/international status (ATN/RUN/IRU/unaligned universities)

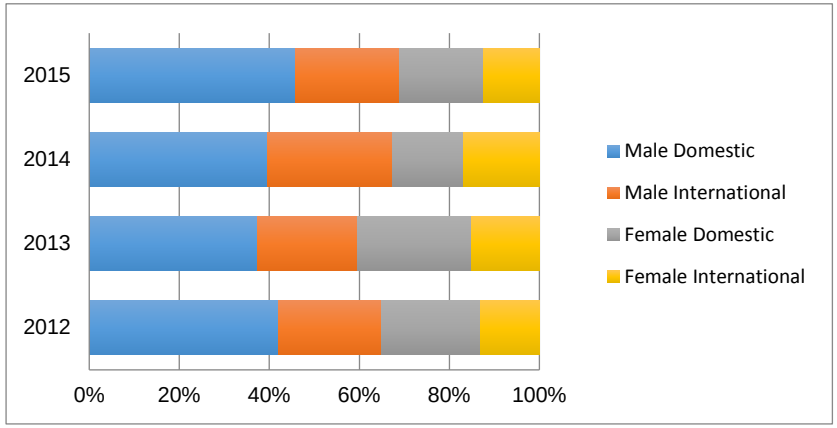


Table 20. Masters by Research student profile in the mathematical sciences by gender and domestic/international status

		Male Dom. %	Male Intern. %	Female Dom. %	Female Intern. %	Dom. M&F %
All universities	2012	57	15	18	10	75
	2013	62	14	20	3	82
	2014	60	18	15	7	75
	2015	56	14	26	4	72

Figure 23. Masters by Research student profile in the mathematical sciences by gender and domestic/international status (All universities)

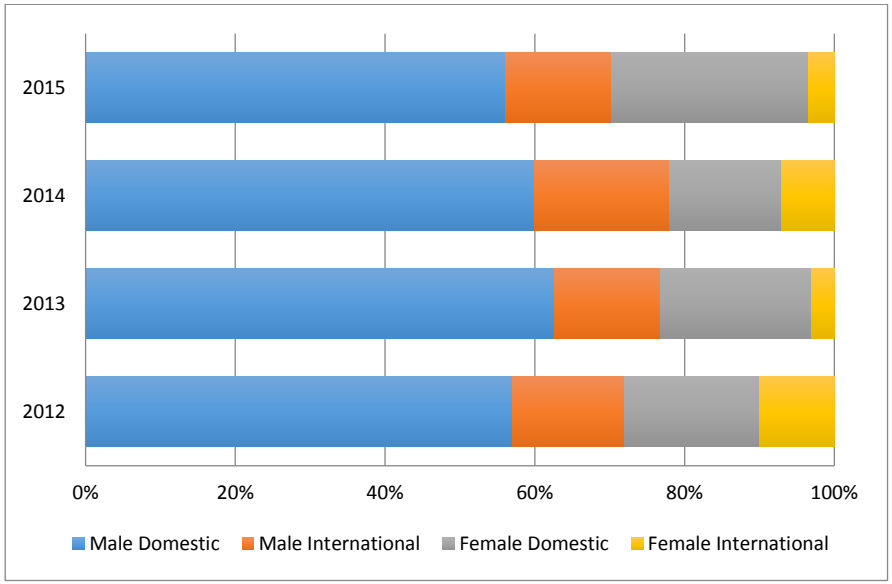


Table 21. PhD student profile by gender and domestic/international status

		Male Dom. %	Male Intern. %	Female Dom. %	Female Intern. %	Dom. M&F %
Go8 universities	2012	46	16	23	15	69
	2013	56	17	16	12	72
	2014	55	19	14	12	69
	2015	53	19	14	14	67
ATN/RUN/IRU/Unaligned	2012	48	22	15	15	63
	2013	35	25	21	20	56
	2014	38	20	21	20	59
	2015	30	30	20	20	50
All universities	2012	47	20	17	15	64
	2013	47	20	18	15	65
	2014	49	19	17	15	66
	2015	44	23	16	16	60

Figure 24. PhD student profile by gender and domestic/international status (All universities)

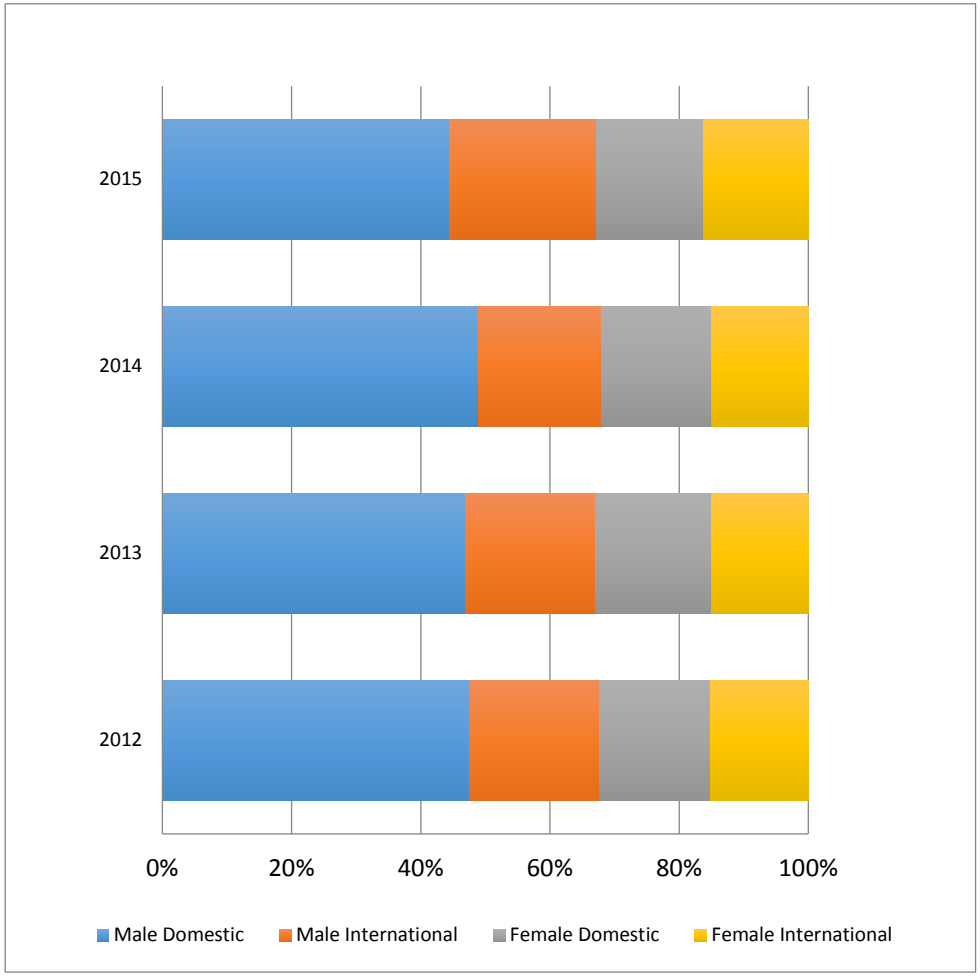


Figure 25. PhD student profile by gender and domestic/international status (Go8 universities)

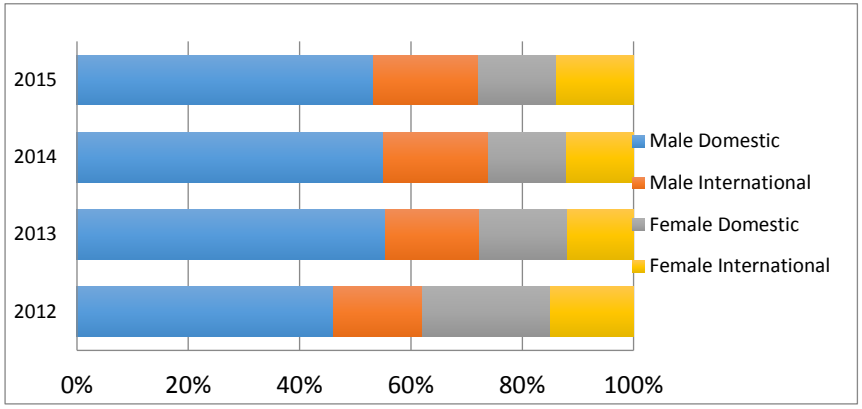
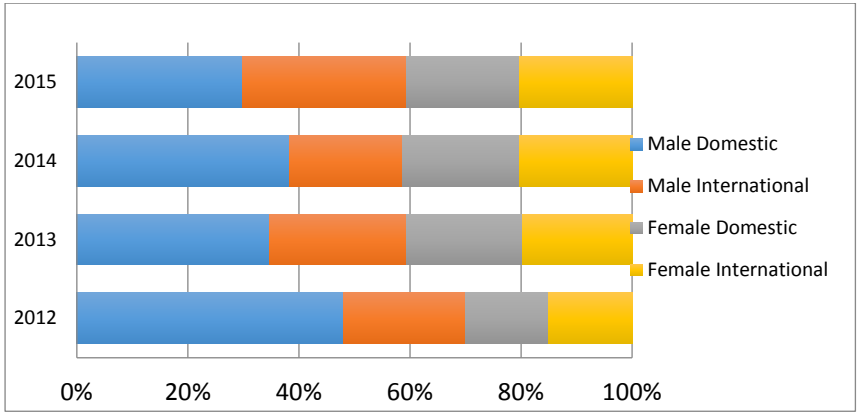


Figure 26. PhD student profile by gender and domestic/international status (ATN/RUN/IRU/unaligned universities)



HIGHER DEGREE COMMENCEMENTS AND COMPLETIONS

Table 22. PhD commencements and completions in the mathematical sciences

	PhD commencements					PhD completions				
	2011	2012	2013	2014	2015*	2011	2012	2013	2014	2015*
Go8	91	88	71	81	113	54	43	52	69	56
ATN	23	40	28	20	19	20	14	11	19	21
RUN	7	1	2	5	5	7	4	3	2	5
IRU	14	15	19	17	13	4	7	10	11	6
Unaligned	18	9	24	26	12	20	9	10	2	14
Total All	153	153 (163)	144 (174)	151 (175)	162	105	77 (88)	86 (110)	103 (120)	102

Table 23. Masters by Research commencements and completions in the mathematical sciences

	Masters by Research commencements					Masters by Research completions				
	2011	2012	2013	2014	2015*	2011	2012	2013	2014	2015*
Go8	12	17	13	13	8	8	13	9	12	9
ATN	3	6	8	2	3	0	1	0	1	4
RUN	0	0	0	2	3	0	0	0	0	1
IRU	5	2	0	3	2	0	2	2	1	1
Unaligned	4	1	3	3	3	0	0	1	2	2
All	24	26 (26)	24 (26)	23 (33)	19	8	16 (16)	12 (13)	16 (23)	17

*Projected figures for 2015. The 2016 AMSI Survey will ask for final numbers for 2015. Note that for the years 2012, 2013 and 2014 commencement and completion numbers were requested twice: once as the projected number in the calendar year of the survey, and for the second time in the following year as a confirmed final number. The numbers in brackets for the years 2012-2014 indicate the final confirmed numbers for that year **plus** projected numbers for that year where universities did not supply final numbers in the following year. The actual number is therefore likely to be closer to the number in brackets, however this is unconfirmed.

Table 24. PhD commencements by gender and domestic/international status 2013-2015

	Male domestic	Female domestic	Male international	Female international	Total
2013	73	19	35	17	144
2014	63	29	37	22	151
2015*	65	19	46	32	162

*Projected figures for 2015

Table 25. PhD completions by gender and domestic/international status 2013-2015

	Male domestic	Female domestic	Male international	Female international	Total
2013	39	14	21	12	86
2014	49	21	13	20	103
2015*	43	21	21	17	102

*Projected figures for 2015

Figure 27. PhD commencements by gender and domestic/international status 2013-2015

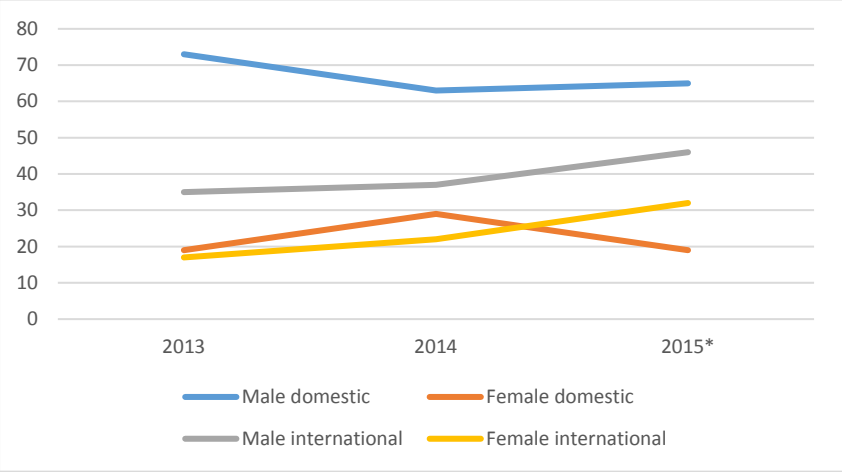


Figure 28. PhD completions by gender and domestic/international status 2013-2015

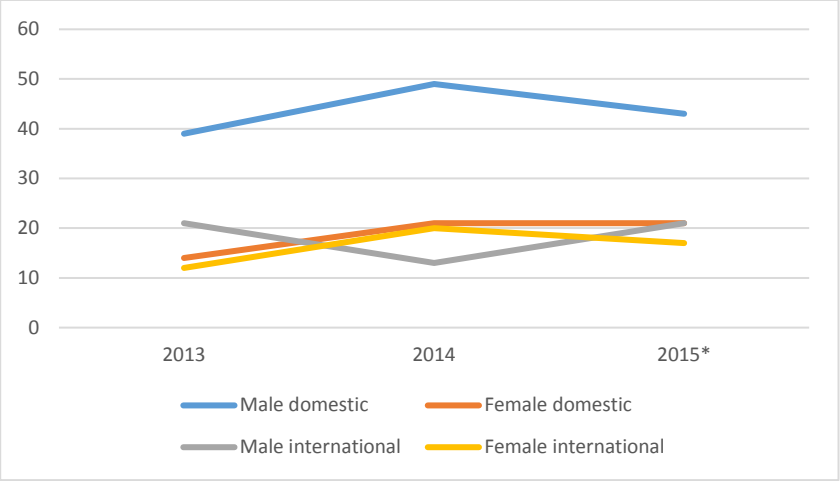


Table 26. Masters by Research commencements by gender and domestic/international status 2013-2015

	Male domestic	Female domestic	Male international	Female international	total
2013	13	5	5	1	24
2014	14	4	3	2	23
2015*	10	6	2	1	19

*Projected figures for 2015

Table 27. Masters by Research completions by gender and domestic/international status 2013-2015

	Male domestic	Female domestic	Male international	Female international	total
2013	5	4	1	2	12
2014	7	3	3	3	16
2015*	10	0	5	2	17

*Projected figures for 2015

Figure 29. Masters by Research commencements by gender and domestic/international status 2013-2015

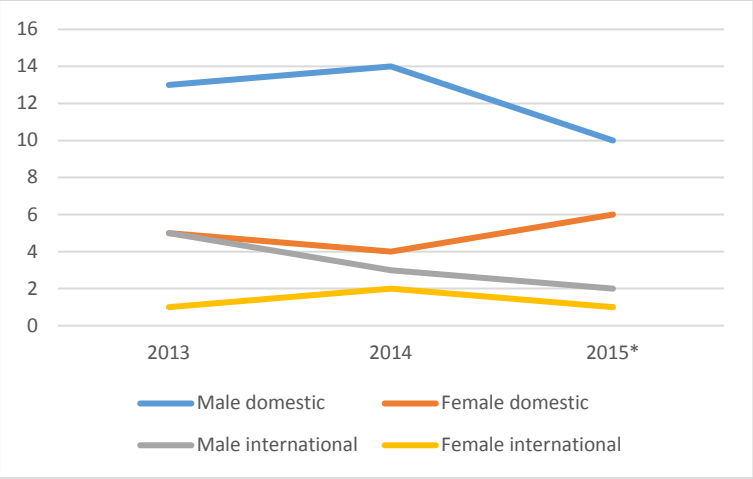


Figure 30. Masters by Research completions by gender and domestic/international status 2013-2015

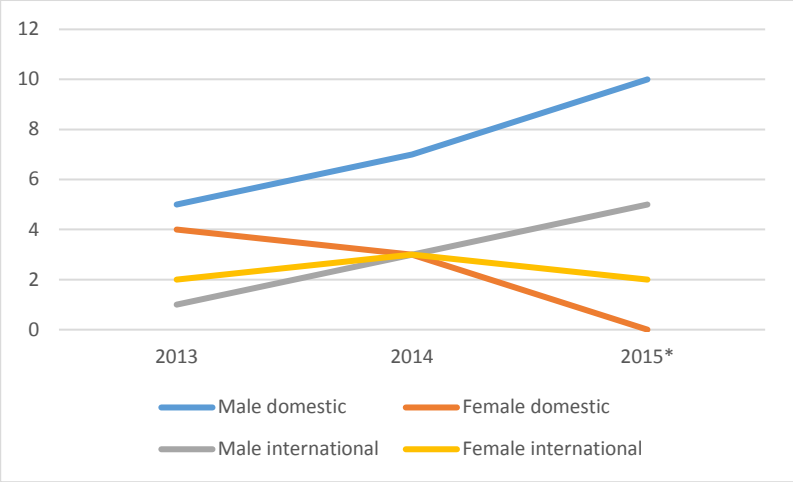


Figure 31. Honours completions by field of study 2013-2015

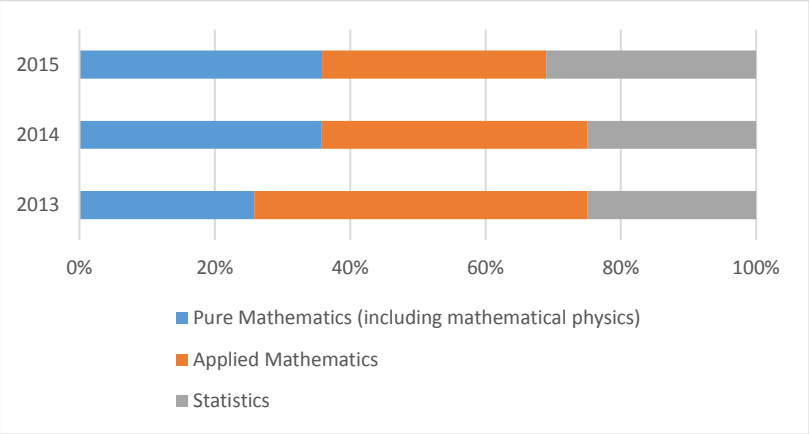


Figure 32. Masters by Coursework completions by field of study 2013-2015

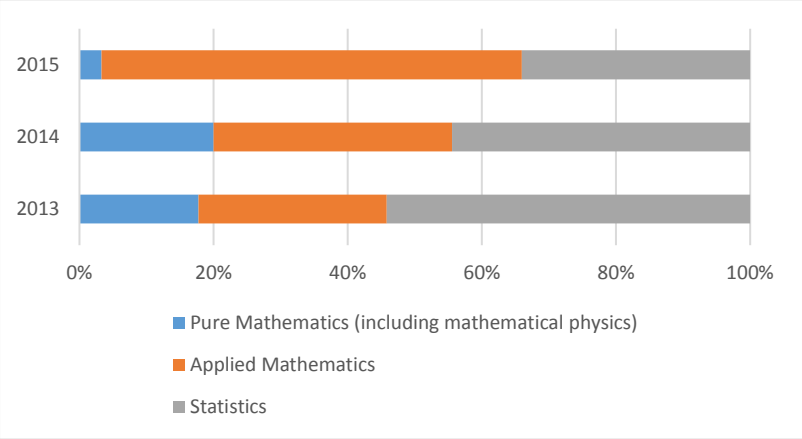


Figure 33. Masters by Research completions by field of study 2013-2015

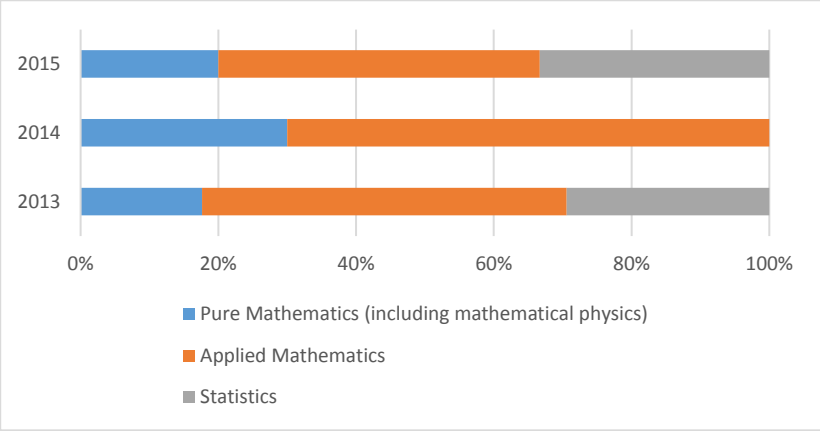
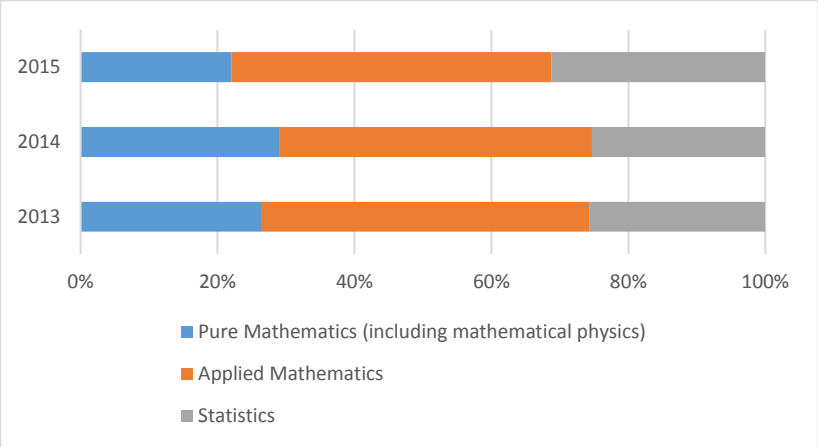


Figure 34. PhD completions by field of study 2013-2015



RESEARCH

Table 28. Number of ARC-funded research staff per university network in the mathematical sciences in 2015 (actual numbers, not FTE) (N=23)

	Level A	Level B	Level C	Level D	Level E
Go8 universities	55	33	18	9	16
ATN universities	4	13	1	2	2
RUN universities	3	0	0	0	0
IRU universities	2	0	1	1	1
Unaligned universities	4	3	2	0	1
All universities	68	49	22	12	20

Figure 35. Number of ARC-funded research staff in the mathematical sciences in 2015 by network (actual numbers, not FTE) (N=23)

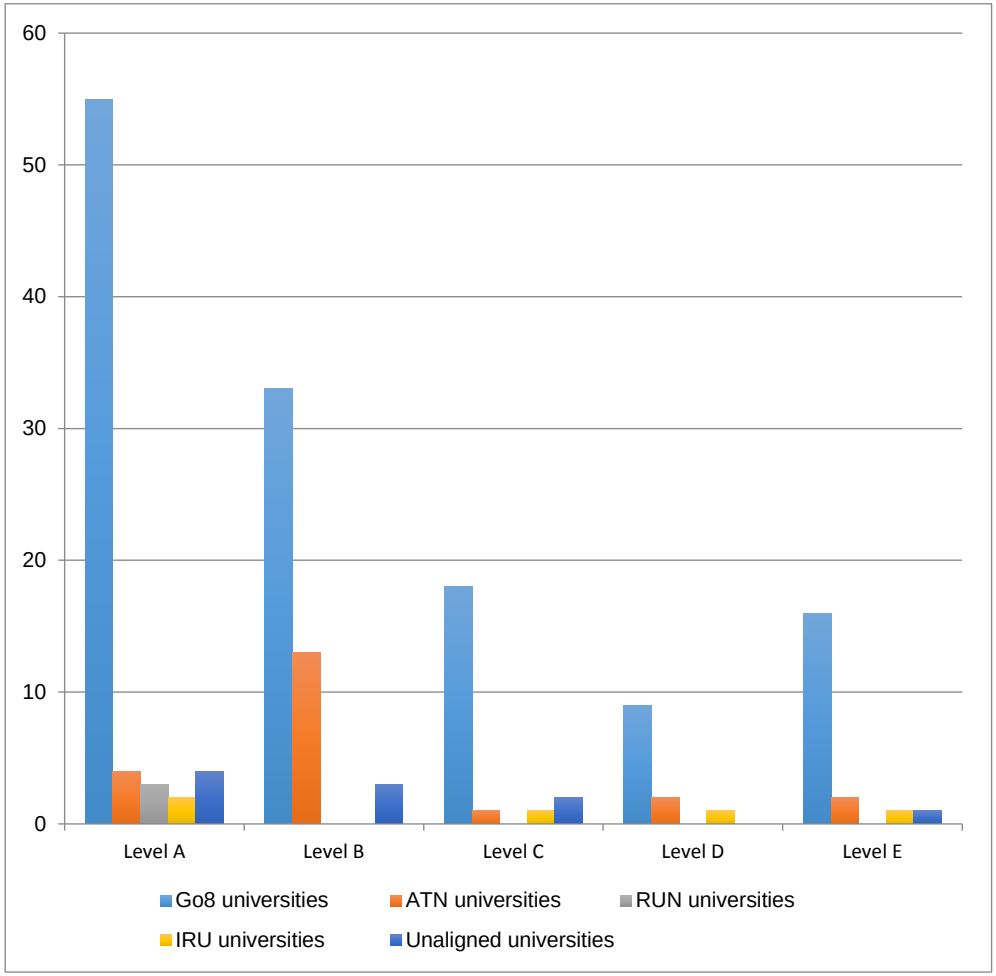


Table 29. Number of grants held in the mathematical sciences

Discovery projects	**2012**	**2013**	**2014**	**2015**
Go8 universities	139	159	133	149
ATN universities	14	12	14	21
RUN universities	3	3	3	4
IRU universities	12	13	13	5
Unaligned universities	11	11	9	9
All universities	179	198	172	188
Linkage projects	**2012**	**2013**	**2014**	**2015**
Go8 universities	14	12	15	7
ATN universities	6	2	2	7
RUN universities	0	0	0	0
IRU universities	3	3	3	1
Unaligned universities	1	1	3	6
All universities	24	18	23	21
OLT grants and fellowships	**2012**	**2013**	**2014**	**2015**
Go8 universities	2	3	3	3
ATN universities	1	1	1	2
RUN universities	0	0	1	1
IRU universities	0	0	1	0
Unaligned universities	0	0	2	2
All universities	3	4	8	8

Table 30. Average estimated success rate in securing ARC funding in the mathematical sciences

	2010-2012 %	**2011-2013 %**	**2012-2014 %**
Go8 universities	31	33	36
ATN universities	17	20	24
RUN universities	33	33	35
IRU universities	21	13	18
Unaligned universities	8	10	10
All universities	24	20	26

Table 31. Number of departments holding a formal research agreement in the mathematical sciences with one or more government agencies

	2012	**2013**	**2014**	**2015**
Go8 universities	3	3	3	4
ATN universities	1	1	1	2
RUN universities	0	0	0	1
IRU universities	0	1	1	1
Unaligned universities	1	1	1	2
All universities	5	6	6	10

Table 32. Number of departments undertaking external research consultancies in the mathematical sciences

	2012	2013	2014	2015
Go8 universities	4	5	6	6
ATN universities	2	2	2	3
RUN universities	0	0	0	2
IRU universities	2	2	3	2
Unaligned universities	1	1	1	4
All universities	9	10	12	17

Table 33. Number of universities maintaining a funded statistical consulting service in 2015

	2015 (N = 26)
Go8 universities	6
ATN universities	1
RUN universities	3
IRU universities	1
Unaligned universities	3
All universities	14

Table 34. Average number of international visitors per department

	2012	2013	2014	2015
Go8 universities	90	60	46	42
ATN universities	5	6	12	19
RUN universities	9	2	5	7
IRU universities	9	13	6	6
Unaligned universities	8	8	10	16
All universities	28	27	18	20

Table 35. Average number of research workshops/conferences per department

	2013	2014	2015
Average Go8 universities	6	4	3
Average ATN universities	1	0	2
Average RUN universities	1	1	1
Average IRU universities	2	1	1
Average unaligned universities	1	2	4
Average all universities	3	2	2

EQUITY AND DIVERSITY

Table 36. Staff and students identifying as Aboriginal and Torres Strait Islander

	2012		2013		2014		2015	
	Staff	Students	Staff	Students	Staff	Students	Staff	Students
All universities	1	33	3	225	4	103	3	151

Table 37. Low-Socio Economic measures taken in 2015

James Cook University: We are a member on the Queensland Stem Education Network (QSEN). See here: https://www.tri.edu.au/news/queensland-stem-education-network-qsen. One of the aims of the network is to raise the profile of STEM in low SES areas. There is a lot of low SES in North Queensland and Far North Queensland! Our focus from JCU has been specifically on mathematics. For example, we are raising awareness about the importance of studying higher levels of maths in school and how it relates to careers people see in our region. We are creating a set of videos to distribute to schools in our region that showcase people in these careers and they talk about the maths they chose in school and that influenced their career path. Alongside of QSEN we are working a lot in teacher education - to ensure we are doing the best we can to produce good quality maths teachers for our region. We are doing this through the OLT funded IMSITE project: http://www.imsite.edu.au/. This is a long term strategy to aid in helping low SES people in our region. As part of the same project we have engaged with guidance officers - telling them about how choices about maths in high school impact on the likelihood of success in university (as opposed to just getting in!).
Queensland University of Technology: Visit by academic staff to low socioeconomic High Schools. University level scholarships, bursaries and Learning Potential Fund.
University of Queensland: The university provides some scholarships to help with living costs for students from low SES backgrounds.
University of Newcastle: is the largest provider of enabling programs in Australia, offering one third of the nation's Commonwealth supported places.
Federation University: The university has always had a high proportion of low SES students. It has offered bursaries, http://federation.edu.au/current-students/assistance-support-and-services/scholarships, appointed retention officers in each faculty and is currently inviting proposals for projects under the Commonwealth's Higher Education Participation and Partnerships Program.
University of Western Australia: The School works with the UWA Disability Office and UWA Equity & Diversity Office on these areas.
RMIT University: takes part in the following initiatives:

School Network Access Program (SNAP) http://www.rmit.edu.au/study-with-us/applying-to-rmit/local-student-applications/equity-access-schemes/types-of-equity-access/schools-network-access-program-snap-applicants/ General equity scholarships: Ernst William Capp Scholarship, Orcadia Foundation Scholarship, RMIT Merit Equity Scholarship, RMIT Equity Notebook Grant, Rural Grant http://www1.rmit.edu.au/browse;ID=qfu980g7mqhc
University of South Australia: Outreach: schools, industry and community: http://www.unisa.edu.au/IT-Engineering-and-the-Environment/Information-Technology-and-Mathematical-Sciences/Outreach-schools-industry--community/
Swinburne University: HEPPP funding initiative currently aimed at demonstrating the relevance of mathematical topics for first year engineering low socio-economic status students.

Table 38. Gender Balance measures taken in 2015

University of Queensland: A number of forums have been held at our University discussing some of the structural impediments and potential hidden biases in our system. We are working to make it clear to job applicants that work can be taken part-time in order to a family compatible work-life balance.
Monash University: adm.monash.edu/human-resources/gender-equity/
University of Newcastle: All committees must have a membership of no less than 33 %of each gender. The University of Newcastle has strategies to achieve appropriate gender representation.
Flinders University: already close to balanced among students and Flinders female mathematicians are active participants in the Women in Mathematics Special interest group.
Curtin University: has set up a workgroup chaired by Prof. Jo Ward to help woman academic staff members to establish their careers. Please contact her at J.Ward@curtin.edu.au for details.
RMIT University: Equity access may be granted to students who apply for a program where there gender has been identified as under-represented: http://www.rmit.edu.au/study-with-us/applying-to-rmit/local-student-applications/equity-access-schemes/types-of-equity-access/gender-in-under-represented-discipline/. Scholarships available to female identifying students: http://www1.rmit.edu.au/browse;ID=bxgkmprxmfhmz
Swinburne University: Establishment of a new Gender Equity Committee in our School of Science (2015). Quoting from the term of reference document: "The Gender Equity Committees will assist in the development and implementation of best practice with regards to gender for recruitment, internal appointments, promotions and professional development of all staff and students, and promote a positive workplace culture for all FSET staff and students which embraces gender equity."

University of South Australia: Hypatia scholarship program: http://www.unisa.edu.au/it-engineering-and-the-environment/information-technology-and-mathematical-sciences/scholarships-prizes-and-awards1/hypatia-scholarship/.
Murdoch University: No strategy, but we have a higher than average proportion of female staff (5/12) and have always had relatively high nos. of female honours students
Queensland University of Technology: School of Mathematics is active in promoting the programs to women - Women in Mathematics event, via scholarships and on or off campus activities.
University of Western Australia: The School works with the UWA Disability Office and UWA Equity & Diversity Office on these areas.
Federation University: The university's gender equity reports are available at http://federation.edu.au/staff/working-at-feduni/equity-and-equal-opportunity/plans-and-reports/workplace-gender-equality-agency-wgea-reports.
Western Sydney University: We have a gender balance requirement on selection panels of at least 40% of each gender. This is a University-wide policy and affects both genders (for instance nursing has the opposite problem to mathematics).
University of New South Wales: We offer four scholarships and two awards that are only available to females.

Table 39. Aboriginal and Torres Strait Islander measures taken in 2015

Monash University: http://www.monash.edu/about/indigenous
Queensland University of Technology: University level scholarships and bursaries to target ATSI students. Staff from faculty and school are members of committees that are targeting both LSEO and ATSIL students.
James Cook University: Through IMSITE (see above) we are forming an ATSI maths teachers network with an ATSI maths teachers conference planned for early 2017. The videos that we mentioned above will have indigenous people in them to send the message that maths is equally important for them in their lives.
La Trobe University: This summer the subject Data-based Critical thinking (a subject in our department) will be delivered to local high school Indigenous students in a new pathway program to promote entry in to La Trobe courses.
University of Newcastle: The Wollotuka Institute is committed to advancement and leadership of Indigenous education at a local, national and global level. The Wollatuka Institute at the University of Newcastle has received Australia's first World Indigenous Nations Higher Education Comsortium (WINHEC) accreditation, recognised for its strong outcomes within Australian Indigenous Higher Education.

Federation University: The University has an Aboriginal Education Centre which assists Aboriginal and Torres Strait Islander students,http://federation.edu.au/about-us/our-university/indigenous-matters/aboriginal-education-centre/student-information and a reconciliation action plan: http://federation.edu.au/about-us/our-university/indigenous-matters/reconciliation-action-plan
University of Queensland: The University has a policy designed to increase the number of ATSI staff employed.
University of Western Australia: The School works with the UWA Disability Office and UWA Equity & Diversity Office on these areas.
RMIT University: RMIT Equity Notebook Grant, Indigenous RMIT Study Support Scholarship, Indigenous RMIT Village or Accommodation Scholarships http://www1.rmit.edu.au/browse;ID=iz5xg5ddp39jz
University of South Australia: Australian Indigenous Mentoring Experience program (AIME) http://www.unisa.edu.au/Study-at-UniSA/UniSA-College/AIME-mentoring/Indigenous Content in Education Symposium 2015: http://www.unisa.edu.au/IT-Engineering-and-the-Environment/student-services/Community-Service-Learning-Project/ICES/indigenous-content-in-education-symposium/ David Unaipon College of Indigenous Education and Research: http://www.unisa.edu.au/Education-Arts-and-Social-Sciences/David-Unaipon-College-of-Indigenous-Education-and-Research/

APPENDIX

LIST OF RESPONDENTS TO THE 2015 SURVEY

Australian Technology Network: Curtin University, Queensland University of Technology, RMIT University, University of South Australia, University of Technology Sydney

Group of Eight Universities: Australian National University, Monash University, University of Melbourne, University of New South Wales, University of Queensland, University of Sydney, University of Western Australia

Innovative Research Universities: Flinders University, Griffith University, James Cook University, La Trobe University, Murdoch University

Regional Universities Network: Federation University Australia, University of New England, University of Southern Queensland, University of the Sunshine Coast

Unaligned universities: Bond University, Deakin University, Macquarie University, Swinburne University of Technology, University of Newcastle, University of Wollongong, Western Sydney University

LIST OF FIGURES

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