

UNCONFIRMED**Australian Council of Heads of Mathematical Sciences****Meeting 1/2020****MINUTES**

The annual meeting of the Australian Council of Heads of Mathematical Sciences (ACHMS) was held at 11:00am Tuesday 18 February 2020 in room 109, theatre 2, level 1, Alan Gilbert Building, The University of Melbourne, Parkville. The meeting was adjourned from 1:00-1:40pm for lunch.

PRESENT**ACHMS Executive Committee**

Professor Tony Dooley (Chair), Professor Jim Denier, Associate Professor Linda Galligan, Professor Gary Glonek and Associate Professor David Yost.

University Representatives

Associate Professor Irfan Altas, Professor Brenton Dansie, Professor Jan de Gier, Professor Joseph Grotowski, Professor Markus Hegland, Professor Bruce Henry, Professor Graeme Hocking, Professor Rob Hyndman, Associate Professor Peter Johnston, Associate Professor Ute Mueller, Dr Luke Prendergast, Professor Asha Rao, Dr Ian Roberts and Professor Gerd Schmalz.

Societies, Agencies, Groups, Observers and Non-Member Invited Speakers

Associate Professor Catherine Attard, Professor Tim Brown, Mr Nathan Ford, Professor Graeme Hocking, Professor Jessica Purcell, Professor John Rice, Ms Janine Sprakel and Professor Peter Taylor.

Proxies

Dr Heiko Dietrich, Dr Simon Dunstall, Dr Maureen Edwards, Professor Paul Hurley, Professor Jessica Kazsa, Professor Inge Koch, Professor William Phillips and Dr Julien Ugon.

Others Attending

Ms Karen Roe (Secretary).

BUSINESS**1. Welcome and Apologies**

The Chair welcomed those in attendance at the meeting.

1.1 Apologies

Apologies were received from Dr Amie Albrect, Professor Bob Anderssen, Professor Adrian Barnett, Professor Andrew Bassom, Professor Gleb Beliakov, Dr Shaun Belward, Professor Peter Bouwknecht, Professor Jennifer Brown, Dr Philip Charlton, Professor Troy Farrell, Professor Kais Hamza, Dr Zlatko Jovanski, Dr Zlatko Jovanski, Professor Tom Lowrie, Ms Chloe Pearse, Professor Aidan Sims, Professor Scott Sisson, Associate Professor Sergey Suslov, Dr Siu-Ming Tam, Professor Neville Weber, Dr Aaron Wiegand, Professor Geoff Woolcott, Professor Brian Yates and Professor Sanming Zhou.

1.2 Proxies and Introduction of New Representatives

Dr Heiko Dietrich, Dr Simon Dunstall, Dr Maureen Edwards, Professor Paul Hurley, Professor Jessica Kasza, Professor Inge Koch, Professor William Phillips and Dr Julien Ugon attended as proxies.

1.3 Minutes of the 2019 ACHMS Meeting

Minutes of the previous meeting held on Tuesday 19 February 2019 were confirmed by the ACHMS as a correct record, subject to a correction to the name of Dr Robert Mun under minute item 3.5.

1.4 Matters Arising

The ACHMS received and noted the action list from the previous meeting. Progress updates were received on the following action items:

- 2019.1 discussion of the topic of a National Research Model is pending;
- 2019.2 questions about the use of FoR codes were addressed to Dr Mun out of session.

1.5 Election of Positions to be Filled (2 Year Responsibility)

The Chair reported verbally that nominations will be called for the positions of applied mathematics representative and pure mathematics representative on the Executive Committee following the conclusion of two year terms by the previous incumbents.

The ACHMS performs the role of spokesperson for mathematics departments across Australia, and its members act as ambassadors in promoting the value of mathematics through its networks, including AMSI which has assisted toward bridging the gap between applied and pure mathematics.

2. Report from the Chair

The ACHMS received and noted a letter dated 6 December 2019 from Ms Jan Thomas notifying the Chair of her intention to step back from any involvement in the ACHMS. The Chair led a vote of thanks to Ms Thomas for her important contribution as Executive Officer since 1998, as well as Ms Kirsten Doert-Eccles for her executive support to the ACHMS meetings during recent years.

The ACHMS discussed a concern raised in the letter about the number of mathematics teachers in secondary schools which is in continuing decline even as the secondary school population is growing. The government is pursuing an increase in the number of teachers employed at high schools who have completed mathematics at university level. Universities have responded by offering subjects to teachers who wish to upgrade their mathematics qualifications.

3. Matters for Discussion

3.1 WIMSIG Report

The ACHMS received and noted the 'Women in Mathematics Special Interest Group (WIMSIG) Report for the 2020 Australian Council of Heads of Mathematical Sciences'. The WIMSIG Chair, Professor Purcell, gave a presentation entitled 'WIMSIG Report' which outlined the history of the group that was founded in 2018 for the purpose of encouraging the training, recruitment and retention of women in the mathematical sciences. It seeks to address the barriers behind the gender gap in the mathematical sciences with strategies that include conferences, mentoring, networking, role models and travel awards. The ACHMS were encouraged to support the WIMSIG by:

- a) submitting to the WIMSIG newsletter any job advertisements and items of interest that highlight the achievements of women in mathematics;
- b) advertising WIMSIG events at their organisations;
- c) facilitating women to attend the first WIMSIG conference at Monash University from 30 September-2 October 2020;
- d) organising local activities to coincide with the International Women in Mathematics Day in May 2020;
- e) being proactive in initiatives to improve gender equity such as telling your local gender equity committee about WIMSIG.

3.2 ICME15 Successful Bid

The ACHMS received and noted a media release dated 3 July 2019 and entitled 'Australia's Mathematics Community United to Win Leading STEM Congress for Sydney'. Following a successful bid by a consortium of eight Australian universities, the International Congress on Mathematical Education (ICME15) will be held in Sydney in 2024. The NSW state government will provide funding and appoint a professional conference organiser. The Chair encouraged the ACHMS members to suggest any key issues for highlighting during his attendance at the ICME15 as the ACHMS delegate.

3.3 Accreditation of Mathematics Degrees

The ACHMS discussed the topic of accrediting mathematics degrees. Accreditation is the domain of professional societies, because these can be objective in assessing the quality of courses and setting standards. For example, the Statistical Society of Australia accredits some degrees and recognises an accredited institution as one whose degrees has been evaluated against set

standards. Those who complete the accredited degrees are recognised as statisticians. Employers look for such professional certifications alongside tertiary qualifications which rest upon the quality and reputation of university degrees.

The benefits of accreditation were identified as quality assurance of degrees, maintaining standards, raising the profile of the profession, and continuing professional development that includes training in areas such as ethics. However it was noted there are other avenues for quality assurance of degrees.

Rather than accredit mathematics degrees (which may be complicated by the inclusion of subjects from other disciplines), it may be more feasible to accredit individuals. Mathematics graduates enter various fields of employment and disperse across a range of sectors. The societies give cohesion to a diverse professional group by keeping in contact with accredited fellows and requiring continuing professional development to maintain standards.

The Chair undertook to email the minute of this discussion to Professor Diane Donovan at the University of Queensland.

3.4 Do We Support the Push for Mathematics to be Compulsory as a Year 12 Subject?

The ACHMS received and noted an undated email from Professor Henry about compulsory mathematics through to year 12. Numeracy is as important as literacy, but only English studies are compulsory across Australia currently. Secondary school is an optimal time during a student's cognitive development to learn mathematics. However the argument in support of compulsory mathematics through to year 12 is impeded by the declining supply of qualified mathematics teachers (refer to minute item 2).

It was noted the decadal plan for the mathematical sciences 2016-2025 did not recommend compulsory mathematics (refer to minute item 4.1). There is a risk that enforced participation led by unqualified teachers may not increase students' competence, but damage the reputation of the discipline overall. Although not optimal, the completion of the 'Essential Mathematics' subject as a remedial measure in the first year of university had successful outcomes (refer to minute item 3.5). An additional strategy to increase numeracy could be to embed mathematics in other subjects at secondary school.

While the ACHMS recognised the value in completing mathematics through to year 12, it concluded that a greater risk for numeracy levels across Australia was the declining number of qualified mathematics teachers in secondary schools. Raising the standard of mathematics teachers should be given priority as a matter of greater urgency.

3.5 Australian Council of Deans of Science Report into School Mathematics as a Predictor of Performance in Science

The ACHMS received a presentation from Professor Rice entitled 'ACDS' about a pilot study conducted by the Australian Council of Deans of Science into the

performance of mathematics and science students at Australian universities. The study investigated the level of mathematics completed at year 12 as an indicator of performance at university level. It revealed that GO8 universities were most successful in attracting into science degrees those students who had completed year 12 mathematics. The pass rates for first year science students were much the same across GO8 and other universities regardless of whether the students had completed general mathematics, mathematical methods or specialist mathematics. Students who completed an 'Essential Mathematics' subject as a remedial measure in the first year of university achieved similar pass rates to those who had completed year 12 mathematics at secondary school.

3.6 The Role of Mathematics Programs in "Service Teaching"

The ACHMS discussed a topic that had been raised at the June meeting of the Australian Council of Deans of Science about services provided by mathematics departments to other departments. Cross-faculty teaching arrangements were in place at several universities between mathematics and engineering, computer science, physics, nursing and psychology. It was agreed the teaching of mathematics should be assigned correctly to trained mathematicians who can convey the broad principles and application of the discipline. Mathematicians provide expertise in course delivery, student engagement and learning design for which their department receives a financial contribution. Their services play an important part in the curricula and may be imperative in certain scenarios, for example to engineers seeking accreditation under rules which stipulate that mathematical tuition must be provided by dedicated mathematics bodies.

A further inter-disciplinary exchange was observed around statistics and data science, and it was asserted that mathematics must have a strong profile in this research space also.

3.7 Any Other Business

Nil.

3.8 Wrap Up and Summary Actions

The next meeting of the ACHMS will be held in 2021.

4. Matters for Noting

4.1 Report from the National Committee for Mathematical Sciences

The ACHMS received the 'Report on Activities of the NCMS by Professor Peter Forrester', former Chair of the National Committee for Mathematical Sciences (NCMS). The NCMS is a committee of the Australian Academy of Sciences with the task of reporting on progress with the implementation of the decadal plan for the mathematical sciences 2016-2025. It was agreed to include items on the ACHMS agenda for universities and other agencies to report at the meetings about progress against the key performance indicators in the decadal plan.

4.2 Report from the Australian Mathematical Society

Nil.

4.3 Report from the Australian Association of Mathematical Teachers

Nil.

4.4 Report from the Australian Mathematical Sciences Institute

Nil.

4.5 Report from the Statistical Society of Australia

The ACHMS received the 'Report from the Statistical Society of Australia for the National Committee for Mathematical Sciences (February 2020)' by Professor Kasza.

4.6 Draft Article for the Gazette

The ACHMS received a draft article for the Gazette entitled 'The Rise and Fall of Mathematical Sciences in Australia' by Ms Thomas.

The meeting concluded at 2.50pm.

Signed by the Chair: _____

and dated: _____

DISTRIBUTION

ACHMS Executive Committee

Professor Anthony Dooley, Chair

Professor Jim Denier, Applied Mathematics representative

Associate Professor Linda Galligan, Deputy Chair

Professor Gary Glonek, Executive Officer

Associate Professor David Yost, Pure Mathematics representative

Professor Jessica Kasza, Statistics representative

University Representatives

Professor Markus Hegland, Australian National University

Associate Professor Irfan Altas, Charles Sturt University

Professor Brenton Dansie, University of South Australia

Professor Jan de Gier, The University of Melbourne

Dr Heiko Dietrich, Monash University

Professor Anthony Dooley, University of Technology Sydney

Dr Maureen Edwards, University of Wollongong

Associate Professor Linda Galligan, University of Southern Queensland

Professor Gary Glonek, The University of Adelaide

Professor Joseph Grotowski, University of Queensland

Professor Bruce Henry, University of New South Wales

Professor Graeme Hocking, Murdoch University and Chair of AMZIAM

Professor Paul Hurley, Western Sydney University

Professor Rob Hyndman, Monash University - Econometrics

Associate Professor Peter Johnston, Griffith University

Professor Inge Koch, The University of Western Australia

Associate Professor Ute Mueller, Edith Cowan University

Professor William Phillips, Swinburne University of Technology

Dr Luke Prendergast, La Trobe University

Professor Asha Rao, RMIT

Dr Ian Roberts, Charles Darwin University

Professor Gerd Schmalz, University of New England

Dr Julien Ugon, Deakin University

Societies, Agencies, Groups, Observers and Non-Member Invited Speakers

Associate Professor Catherine Attard, Mathematics Education Research Group of Australasia

Professor Tim Brown, AMSI

Dr Simon Dunstall, CSIRO

Mr Nathan Ford, Australian Mathematics Trust

Professor Graeme Hocking, Australia and NZ Industrial and Applied Mathematics

Professor Jessica Kazsa, STA Mathematics Cluster Representative

Professor Jessica Purcell, AustMS Women in Mathematics Special Interest Group

Professor John Rice, Executive Director, Australian Council of Deans of Science

Professor Scott Sisson, Statistical Society of Australia Inc.

Ms Janine Sprakel, AMSI - Schools

Professor Peter Taylor, ACEMS

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Professor William Phillips, Swinburne University of Technology

Dr Julien Ugon, Deakin University

Observers

Ms Karen Roe, Secretary