hcf highest common factor
Newsletter of The Australian Association of Mathematics Teachers Inc.
March 2015

From the President

I wonder what you recall about your own training to be a teacher? For some of us it means remembering back to the days of flared trousers and platform shoes... and for some it will be a shorter trip down memory lane. Could teacher education in Australia be done better? Recently, federal Minister for Education Christopher Pyne created the Teacher Education Ministerial Advisory Group, TEMAG, to "provide advice to the federal Minister for Education on how teacher education programmes could be improved to better prepare new teachers with the practical skills needed for the classroom" (www.studentsfirst.gov.au/terms-reference). The group was led by Professor Greg Craven, Vice-Chancellor of the Australian Catholic University; AAMT's Immediate Past President, Professor Kim Beswick, was also a member. AAMT made a submission to TEMAG, and Will Morony and I attended a face to face session with members of the group to pass on our thoughts about teacher education on behalf of AAMT.

While many institutions provide excellent teacher training, I found much to be concerned about when reading the TEMAG report: there are situations where the work being done in initial teacher training in Australia is far from best practice. This seems to fit with some of the stories that I have heard from younger colleagues about their practicum experience, for example. It is essential that teachers in training are mentored by enthusiastic, well qualified and capable teachers. AAMT is also concerned that entry requirements to teacher education courses should be set at a level that reflects the intellectual demands and challenges of teaching.

The TEMAG Report was released on 13 February 2015 and is available online from www.studentsfirst.gov.au/teacher-education-ministerial-advisory-group. In total, 38 recommendations were made to achieve improvements in both the content and delivery of initial teacher education courses in Australia and they reflect five themes:

- stronger quality assurance of teacher education courses;
- rigorous selection for entry to teacher education courses;
- improved and structured practical experience for teacher education students;
- robust assessment of graduates to ensure classroom readiness; and
- national research and workforce planning capabilities.

The Australian Government has considered the *Action Now: Classroom Ready Teachers Report* and released its response. It has noted the recommendation for "an overhauled national accreditation process for initial teacher education programs administered by a national regulator" (TEMAG report) but instead has opted to give greater responsibility to AITSL (Australian Institute for Teaching and School Leadership). Indeed, if you go to the AITSL website (www.aitsl.edu.au/media-newsroom/multimedia-centre) you can view a video of Professor John Hattie, AITSL Chair, talking about TEMAG and what lies ahead. Certainly AAMT looks forward to contributing to processes that improve teacher education. We would particularly wish to see standards that reflect particular knowledge of mathematics, and pedagogical content knowledge that is distinct to our role in teaching mathematics.

Ongoing support and professional learning for teachers is a

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related issue, and I encourage all AAMT members to join at least one of the *Connect with Maths* online communities. These communities provide a dynamic online forum for teachers to learn through engaging with colleagues and experts in discussions, webinars, links, downloads of teaching ideas and more! Find the links on the AAMT website under the Communities tab and see how you and your colleagues can benefit.

Best wishes.

Mary Coupland, *President*
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From the CEO

Transition points abound in education: starting school, moving from primary to secondary, and from school to post-school, whether that be work, training or higher education. For mathematics there is a particular need to pay careful attention to those transitions in order to understand and build on students' prior learning.

Some of the factors with an impact at the transition from school to university in mathematics include:

- decreasing numbers of students in intermediate and advanced level mathematics in secondary schools;
- perception that many students entering university in STEM areas are poorly prepared, leading to calls for re-establishing the role of prerequisites and the need for 'bridging courses';
- changed curriculum in senior school mathematics due to the advent of the *Australian Curriculum: Mathematics*; and
- differing views and practices regarding the use of technologies in learning and assessing mathematics.

These matters are all in the broader context of the increasingly worrying drift of young talent away from pathways into science, technology, engineering and mathematics (STEM) careers.

As reported last year, AAMT and Australian Council of Deans of Science (ACDS)[1] conducted a conference to bring together leading practitioners from schools and universities to consider the issues at the transition from school mathematics to studying university courses with significant mathematical content (e.g., mathematics, physical sciences, finance, engineering, etc.). The *Connections and Continuity: Mathematics from School to University* conference was held 1–2 December 2014 at the University of Canberra. The potential value of what we hoped to achieve convinced the Office of the Chief Scientist and the Office of Teaching and Learning to provide some funding support and both AAMT and ACDS appreciate their contribution.

There were around 100 invited participants, roughly half from each sector. My overwhelming sense was that, wherever they came from, those present had a great deal in common with each other—far more than that which might divide them. Their shared commitment to mathematics and students' learning meant that they could work through differences in constructive ways.

The model for the conference was similar to that of successful previous AAMT 'special interest' conferences: input from practitioners about their practice was used to stimulate discussion about the issues. Participants' input will give rise to a joint communiqué designed to have widespread influence within the profession and with government. The finalisation of the communiqué is currently under way, but, in essence, it captures the value of collaboration between colleagues as a practical way to create connections and continuity across the transition from school to university. Without giving too much away, the communiqué is likely to encourage:

- greater diversity of styles of mathematics teaching;
- the importance problem-solving and integrating mathematical procedures and skills into broader contexts that involve communication and critical thinking;
- mathematics teachers as people who 'do' mathematics as part of their professional engagement; and
- that changed emphases in mathematics require changes in assessment.

One way that the spirit and work of the *Connections and Continuity* conference can spread is through local gatherings of mathematics teachers from schools and universities that focus on sharing and analysing practice—AAMT Council will be discussing this with your local association, so stay tuned for details.

Will Morony,
Chief Executive Officer
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1 The ACDS brings together the leaders of the units in universities that contain the mathematics faculty. For a few years, the ACDS has been sponsoring efforts to improve the quality of the teaching of mathematics in the undergraduate years. As an example, a forum in Sydney at the start of 2014 attracted over a hundred people—largely practitioners—who generated a position on the issue of university prerequisites and assumed knowledge. See http://fyimaths.org.au/workshops/national-forum for further information.

Australian Mathematics and Science Partnerships Program

The Australian Mathematics and Science Partnership Program (AMSPP) is a major program of the Australian Government that is designed to "build theoretical and pedagogical skills of school teachers to deliver maths and science subjects" and "encourage more students to study science, technology, engineering and maths courses at university". Funding has gone to universities to work in 'innovative partnerships' with national reach.

AAMT is partnered with five of the funded projects over the period 2014–17. There are two aspects to these partnerships. The five partnered projects will collaborate to co-design and develop a web portal of professional learning resources that will disseminate the work of the projects for teachers and schools. Each of the partnered projects also involves AAMT undertaking a range of tasks that are specific to achieving the objectives of the project—these can be broadly described as connecting the work of the project to the profession.

The five projects and the lead partner university are:

- **University of Tasmania**
  Towards Educating Mathematics Professionals Encompassing Science and Technology (TEMPEST)
  —will pilot and develop professional learning and other resources in line with a quality assurance framework that it will develop and share across the projects.
- **University of Technology, Sydney**
  Maths Inside: Highlighting the Role of Mathematics in Society as Motivation to Engage More in Mathematical Activities
  —will develop inspirational videos and classroom resources that 'unpack' the mathematics involved in some of CSIRO's leading edge developments in science and technology.
- **RMIT University**
  Reframing Mathematical Futures: Building a Learning and Teaching Resource to Enhance Mathematical Reasoning in Years 7 to 10
  —project will develop assessment tools for the 'big ideas' in algebra, geometry and measurement, and statistics and probability.
- **University of South Australia**
  Excellence and Equity in Maths: Aboriginal and Torres Strait Islander Student Achievement and Tertiary Aspirations in Mathematics
  —will work with clusters of secondary schools to encourage and support more Aboriginal students to study the higher level mathematics subjects in Years 11 and 12.
- **University of Canberra**
  National Mentoring for Science Teachers
  —AAMT will establish a small group of expert teachers to advise on the mathematical demands that arise in teaching junior secondary physics and chemistry, and how science teachers can approach these constructively.

These projects are still very much in their start-up phase, but as they progress there will be opportunities for members to be involved in the development and trialling of classroom materials, providing advice, and so on. Expressions of interest will soon be sought from members who would like to be part of the small group assisting the mentoring project.

These are all exciting projects and regular updates will be provided through this newsletter and elsewhere.

Annual General Meeting

The Annual General Meeting of the association will be held at 4.00 pm on Saturday 23 May 2015 at Queechy High School, 161 Penquite Road, Norwood, Tas. (venue for the conference of the Mathematical Association of Tasmania).

The business of the meeting (as outlined in AAMT constitution) will be to:

- confirm the minutes of the 2014 AGM;
- receive the President's report for 2014;
- receive the Association's financial report and Auditor's report for 2014;
- appoint an Auditor for 2015;
- receive the Chief Executive Officer's report for 2014;
- elect the President 2016–17 (if necessary);
- any other business (please contact your Councillor if there are matters you wish to have discussed).

All individual or life members of the association are eligible to be nominated for President by their State/Territory Councillor.
Under AAMT's constitution (adopted in 2012), all individual members, life members and nominated persons of institutional members are entitled to vote (either in person at the meeting or by proxy).
Nominations for President close 31 March.
Information about nominees and voting procedures (should an election be required if more than one nomination is received) will be emailed to all members prior to the meeting.

Special offer for AAMT members from Matific

Matific is an online maths resource mapped to the F–6 curriculum that can help teachers prepare and present maths activities. Hundreds of games can be presented on the interactive whiteboard, played independently on a computer or tablet, or used as a warm-up activity before a maths class. Matific is free for teachers. You can find their resources at www.matific.com.au.

As a special offer for AAMT members, Matific is offering free home access for students in 2015 as well—this is normally $10 per student per year. The offer also includes admin and training support for teachers at no cost to you or your school so you can learn how to search effectively for content, plan your lessons and make use of the reporting tools.

To sign up for this offer, please submit your details on the form at www.aamt.edu.au/Special-offers and AAMT will forward your information to Matific.

ICME14 for Australia?

As has been reported, a consortium of national mathematics organisations that includes AAMT is bidding to hold the 14th International Congress on Mathematics Education in Sydney in 2020. After submitting a written bid document in 2014, the consortium hosted a site inspection visit from a delegation from the International Commission for Mathematics Instruction (ICMI) in February. Given that Sydney's International Convention Centre is still being built, it was something of a 'virtual' inspection. However the visit went extremely well, with the delegation impressed by the strength of the professional components planned, and by the Darling Harbour area in Sydney as a very good location for the congress.

Some supplementary material is being prepared, with the ICMI Executive due to make its decision in May. Australia's competition is China (Shanghai) and USA (Honolulu), so it is something of a 'David versus Goliaths', but the Australian team remains hopeful.

Connect with Maths

Connect with Maths, the Commonwealth Mathematics and Science Participation Project funded for 2012–16 is now in its third year. Four online education communities have been established to support the teaching of mathematics (Indigenous Learners, Early Years, Maths in Action, Engaging All Students). In July 2015, the *Digital Learning and Mathematics* community will be launched to complete the suite for teachers of mathematics.

The project has seen steady growth of members in 2014 across all sectors with involvement by mathematics specialists, mathematics officers from education authorities, tertiary mathematics educators, early learning centre and pre-service educators, secondary and primary teachers, as well as home school parents.

To join a community or to investigate the free webinars on offer, go to www.aamt.edu.au/Communities.

AAMT 2015 conference

The conference program is shaping up to be very interesting and informative! A draft program should be available around mid-April. Late offers to present may yet be accepted.

Be sure to register before 1 May—to beat the late fee! To register and for all conference information, go to http://tiny.cc/aamt2015.

STEM connections

STEM Connections is a project designed to investigate the efficacy of an integrated approach to teaching science, technology, engineering and mathematics (STEM) in junior secondary settings. Is an integrated approach, as opposed to teaching individual disciplines, more effective in terms of transferring knowledge, recognising connections between subjects, increasing engagement, and encouraging STEM careers? This is exciting classroom action research!

The project has been initiated and funded by ACARA. Thirteen schools, representing all States and Territories, are involved. AAMT is working closely with ACARA to support these schools to deliver their projects and reflect on their experiences. There are many different delivery models—separate enrichment classes, entire year levels, team teaching, guest lecturers, industry expertise—and many different projects—an environmental app, a vertical garden, model racing cars, a cosmetic product... and lots more. There is a deliberate focus on engaging local business, industry and community partners. Look out for regular updates and reports of these schools' experiences.

The Australian Association of Mathematics Teachers (AAMT) Inc. is a federation of:

Canberra Mathematical Association (CMA)
Mathematical Association of New South Wales (MANSW)
Mathematical Association of South Australia (MASA)
Mathematical Association of Tasmania (MAT)
Mathematical Association of Western Australia (MAWA)
Mathematical Association of Victoria (MAV)
Mathematics Teachers Association of the Northern Territory (MTANT)
Queensland Association of Mathematics Teachers (QAMT)