

# hcf highest common factor

Newsletter of The Australian Association of Mathematics Teachers Inc.

August 2011

## From the President Teaching and researching in mathematics education: Two sides of the same coin



This HCF column is about the relationship between the teaching of mathematics and research about that teaching. It is prompted by the highly successful combined conference between AAMT and the Mathematics Education Research Group of Australasia (MERGA) that was held in July in Alice Springs. There have been adjacent conferences of the two associations previously, and it was possible to attend both, but the two conferences had distinct and separate foci. Indeed, in the past, there has been something of a demarcation between mathematics education research as being the province of MERGA and practice as being the domain of AAMT. The experience of the July conference requires us to rethink that demarcation.

Readers might be interested to know that one of the objects of AAMT in the proposed new constitution (currently being developed) is “to encourage and promote research in the teaching and learning of mathematics, and the consideration of the findings of such research by its members and others”. This makes a strong statement about the contribution that research makes to improving teaching.

In fact, there has been a much stronger imperative for teachers to

engage in research in recent years. Many recent government funding programs have required teachers to gather evidence of the impact of the particular initiatives, and so the methods of gathering data, writing reports, and formulating recommendations for action are familiar to everyone who has been involved in those programs. AAMT initiatives also have had a research dimension. The AAMT *Standards for Excellence in Teaching Mathematics in Australian Schools* and the associated processes for certifying the Highly Accomplished Teachers of Mathematics (HAToM) are founded on the gathering of evidence. The clusters in the exciting Make It Count collaboration are focused not only on ways of improving the learning of Indigenous students but also on gathering evidence to convince policy makers and others about the impact of the collaboration. The basic processes of research are very familiar to teachers. These processes usually involve teachers identifying a particular focus or question, gaining awareness of similar investigations elsewhere, systematically gathering evidence, reflecting on that evidence, and either acting on the evidence or formulating recommendations for others. Many practitioners engage in these processes in every lesson they teach. There are also many examples of successful collaborations between researchers and teachers who are exploring aspects of classroom practice.

At the AAMT–MERGA conference, there was a wonderful synergy between researchers and practitioners. In many

of the sessions I attended there was a mix of participants, some following the research strand and others the professional (i.e., teaching) strand. This had the effect of focusing the attention of the presenters onto the mixed nature of the audiences. In sessions in the research strand, presenters made efforts to relate their research to practice and particularly emphasised suggestions on ways that practitioners could respond. For sessions I attended that were part of the professional strand, presenters seemed to emphasise the evidence that they had gathered about their practice. The scheduling of sessions from each strand in the same group meant that all participants had the opportunity to hear presentations from both research and professional strands. These dual foci were also evident in the plenary and major presentations. In other words, the researchers were able to direct their attention to practice, and the practitioners could see the value of carefully gathered evidence.

I encourage mathematics education researchers to offer to present research findings at the conferences of their local affiliated mathematics association, not only to share their findings but also to hear the reactions of teachers to those findings. I also encourage teachers to share the evidence that they are collecting about their teaching at those conferences. Both groups should note that the AAMT journals are keen to publish research on mathematics teaching and learning, and on teaching projects that use evidence to formulate recommendations.

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supporting and promoting mathematics education

It is an exciting time now for national representative professional associations. AAMT has developed a strategic plan, and is currently preparing a revised constitution. The new constitution is intended to foster the building of closer relationships between AAMT and affiliated associations, with this acknowledgement of the contribution of research to improving teaching being one of the platforms.

**Peter Sullivan, President**

## From the CEO

A friend and colleague, and a long term stalwart of AAMT, called a few weeks ago. In the twin contexts of having retired and wanting to downsize, he had decided to quit his collection of mathematics books. He asked whether I wanted to have a look through them before he took them to the charity shop, in case there was anything useful to AAMT. I said yes.

Subsequently, ten boxes turned up. It is noteworthy that all the boxes originally contained wine, but that is another story. Having a chance to go through them was worth it, just for the fact that there were a few AAMT titles of which there were no archival copies in the office.

In addition to lots of books on mathematical topics that ranged from the familiar to the obscure, and some historical gems such as turn of the 20th century algebra text books, there were a number that took my eye for various reasons.

Among these, I found the *VNR Concise Encyclopedia of Mathematics*—with diagrams and colour, just the sort of thing we needed before Wikipedia—and *Turner's Four-Figure Mathematical Tables*—what we needed before there were slide rules or calculators or computers.

Others are probably very relevant today: *Diagnosis and Remedial Teaching in Arithmetic* from the 1950s analyses student errors, although some of the language used to describe students is not exactly acceptable today; *Romance in Arithmetic* is a strange title for a lovely little book that takes a timeless look at the history of money, weights and measures, and time as important uses of mathematics across cultures and the centuries.

There were maybe a dozen books of puzzles, recreations, challenges and so on. One of these was *The Joy of  $\pi$* —an enthusiast's exploration of this fascinating, elusive number. You have to want to read a book with a chapter entitled "The Personality of Pi". There was also humour like *Bluff Your Way in Maths*, which contained the quote: "Probability predicts many surprising things, none of which ever happens in real life, as you might expect." Think about it...

What struck me was the diversity of the collection, and the passion for their particular slant on mathematics that drove the authors. I suspect that when I am absorbed in my day-to-day work, I lose sight of the rich tapestry of mathematics and these passions, as exemplified by these books. It was good

to have this reminder—I think we all need that kind of personal re-energising from time to time. I am looking forward to working on some of the puzzles and challenges over lunch; and reading a couple of the books that give popular accounts of areas of mathematics with which I am not familiar.

Also in one of the boxes was *Learning and Applying Mathematics, Proceedings of the Seventh Biennial Conference of AAMT, January 1978*. It contains about 70 papers in seven themes: Attitudes; Curriculum Constructions; Concept Building; Computing; Problem Solving; Art and Design; Research. Most of these themes remain topical; others have gone out of fashion.

The Editor was Doug Williams. The presenters included Cal Irons, Gilah Leder, Ian Lowe, Bruce Henry, John Mack, Neville de Mestre, John Malone, Peter Galbraith, Marjorie Carss, Kaye Stacey, Susie Groves, Jack Bana, Warren Atkins, Ken Clements and John Gough, all of whom are still contributing in various ways—in fact about half were at the most recent AAMT–MERGA Conference. Others from among the presenters are sadly no longer with us, including Kevin Collis, John Gaffney, Peter O'Halloran and Geoff Giles. So as well as being reminded of the richness of the discipline, I was humbled by the reminder that our field is populated by people who have made outstanding contributions during a lifetime of commitment.

**Will Morony, Chief Executive Officer**

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## Revisions to the AAMT Constitution

Members will be aware that a three-year Strategic Plan was adopted by the AAMT at the January 2011 Council meeting. The Strategic Plan is a response to the changing national education environment. It anticipates a need for closer relationships between the State and Territory affiliates and AAMT, and between the affiliates themselves.

The need to revise the AAMT Constitution became more urgent in the light of the Strategic Plan. In particular, there is a need for a more responsive governance structure, and a model of

affiliates that mirrors our familiar State/Territory/Federal relationships. This model would facilitate much better communication with and between affiliates and AAMT.

There are many aspects to the changes, but perhaps the key ones are the move from two councillors per State and Territory to one, having the Council meet much more regularly (at least four times per year face to face) and doing away with the Executive entirely.

Presidents of the Affiliated Associations have been involved in directing the work to revise the

Constitution, and legal advice has been obtained. The work has also drawn on the governance of other organisations that are similar to AAMT.

A penultimate draft will be the subject of consideration by the Affiliated Associations during September. After that, a final version needs to be sent by the middle of October to meet the requirement of three months notice for the vote to be held at the January 2012 AAMT Council meeting. If you are interested in contributing to your local association's analysis and response to that draft, please contact them directly.

## ACARA news

During 2010 there was initial consultation about the Senior Years of the *Australian Curriculum: Mathematics*. AAMT members provided advice on the drafts of the four courses, and AAMT made a full submission to ACARA.

Since receiving that feedback, ACARA has appointed writers and established an advisory panel to revise the courses on the basis of feedback received. On 1 August there was a national consultation workshop to provide advice on the progress being made; AAMT was represented at that workshop by representatives from each of the State and Territory associations.

At the August meeting, the following proposed timeline was presented, with the caveat that it needs to be endorsed by Ministers at their October meeting. The next key event is for a further consultation workshop, involving the August group, to be held in November to review the further progress. Consultation on the proposed courses will occur from March 2012, with a major national consultation forum in July to review and advise on the proposed final curriculum. The plan is for the courses to be finalised in September, ready for publication in October 2012.

This is an extended timeline. This work is complex, especially due to the differences in assessment and credentialing arrangements in the jurisdictions, and it is sensible to allow sufficient time to carefully work through the issues. However, it will be nearly two years from the release of the initial drafts in 2010 until the penultimate draft becomes available in March next year. AAMT expressed concern about the process in the development of the F-10 curriculum in which an initial draft was all that was available for a considerable period, even though there was a great deal of ongoing work to make improvements. Insiders knew about these, but outsiders—the vast majority of AAMT members—did not.

AAMT Executive has recently discussed this matter and would appreciate any thoughts you may have about the appropriateness of such a long gap in providing public information about changes and improvements being made in the Senior Years national curriculum. Contact [feedback@aamt.edu.au](mailto:feedback@aamt.edu.au) if you have any thoughts on this matter, or indeed anything to do with the development of the *Australian Curriculum: Mathematics*.

## ICME-12

The next International Congress on Mathematical Education (ICME) will be held in Seoul, Korea, on 8–15 July 2012. Held every four years, ICME is a major event in the world of mathematics education. This will be ICME-12.

In some recent promotional material, the organisers have said that the congress will be about “worldwide trends in mathematics education research and practice at all levels” and “improving the quality and professionalism of mathematics education through international cooperation, research, and exemplary cases”. A sense of the scope of ICME-12, can be found at [www.mathunion.org/pipermail/icmi-news](http://www.mathunion.org/pipermail/icmi-news). This contains a summary, as well as the call for papers for the Topic Study Groups, just one of the components of the program for ICME-12.

More information about the congress itself can be found at the official ICME12 site ([www.icme12.org](http://www.icme12.org)). Australia has had a strong contingent at ICMEs, ever since ICME-5 was held in Adelaide in 1984. Indeed, in the past, AAMT has established a formal ‘delegation’ and been part of a promotional stand with other Australian mathematics groups. Stay tuned for details.

## International Mathematics Olympiad

The 2011 International Mathematical Olympiad (IMO) took place in Amsterdam, Netherlands, 16–24 July. Each member of the Australian team won a medal, and overall the Australian team was placed equal 25th of 101 countries, tied with Hungary and Serbia.

Silver Medals were won by Tim Large (Sydney Grammar School), Declan Gorey (Sydney Boys High School) and Yanning Xu (St Peter’s College, SA).

Bronze Medals were won by Angel Yu (Perth Modern School), Colin Lu (Melbourne Grammar School) and Nancy Fu (James Ruse Agricultural High School, NSW).

The IMO Team is managed by the Australian Mathematics Trust, with support from the Australian Government, AAMT, and the Australian Mathematical Society. Congratulations to all members of the team!



## Productivity Commission

The Australian Government’s Productivity Commission produced an Issues Paper and has sought submissions to its study of the Australian Schools Education Workforce. The full scope of the study is well beyond AAMT’s concerns and interests. However, there are matters signalled in the Issues Paper that are important to AAMT members. These include shortages of mathematics teachers, pre-service teacher education and teacher professional development. As a result, the Association made a formal submission to the study during August. The Commission will release a draft report in November, with the Final Report to Government on 22 April 2012.

IMO Team (from left): Nancy Fu, Colin Lu, Tim Large, Declan Gorey, Angel Yu, Yanning Xu.

## Reach for the Stars

You may have seen the recent television interview of the Federal Education Minister, Peter Garrett, promoting National Literacy and Numeracy Week and Reach for the Stars, who said:

“One of the things that I think would be fantastic for schools who haven’t been involved in literacy and numeracy week in the past is to get involved this time. We had about I think twelve hundred schools last year, it’s a fantastic program and there’s lots of great online material that teachers can use and that kids can use as well.” (A full transcript is available on DEEWR’s website; go to <http://aamt.delivr.com/188ce>.)

The theme for Reach for the Stars this year is “Room to Learn: Telling the Story of Australia’s Classrooms” which asks the question, “What does YOUR classroom look like?”

National Literacy and Numeracy Week runs from Monday 29 August to Sunday 4 September. Register your school to go into the draw to win some great prizes. Go to [www.literacyandnumeracy.gov.au/reach-stars](http://www.literacyandnumeracy.gov.au/reach-stars)

## Free online resources

AAMT is working closely with Education Services Australia to assist teachers in the successful implementation of the *Australian Curriculum: Mathematics* through the delivery of online resources. Collaboration with the Mathematical Association of Western Australia, the Mathematical Association of Victoria and the Mathematical Association of South Australia has been a critical part of the project, which is a step on the way to building a useful and well-targetted set of mathematics resources accessed through Australian Curriculum Connect. The resources presented will be linked directly to the content description from the curriculum and will include materials for direct use in the classroom as well as professional articles, also with a distinct classroom application.

You can access these and other resources at [www.scootle.edu.au](http://www.scootle.edu.au).

## AAMT–MERGA conference

The AAMT–MERGA conference—incorporating the 23rd AAMT Biennial Conference and the 34th Annual Conference of the Mathematics Education Research Group of Australasia—saw over 500 delegates gather in Alice Springs in the first week of July. The program (over 250 presentations) delivered a broad mix of research and professional practice topics, including inspiring keynote presentations from Chris Matthews (Griffith University), Mike Shaughnessy (USA), Marta Civil (USA), Rosemary Callingham (University of Tasmania) and Alice Springs local Matt Skoss (at what other conference would you find one of your keynote speakers as your bus driver?). Highlights of the social program undoubtedly included the Presidents’ Reception watching the sun set on the MacDonnell Ranges, and the outdoor conference dinner in a quarry under the stars which was attended by over 400 people!

The conference organisers would like to thank delegates for their feedback about the conference.

You can find photos, videos and more from the conference at [www.netvibes.com/aamtinc](http://www.netvibes.com/aamtinc), or go to <http://vimeo.com/channels/219986>.

## DATES TO NOTE

29 August – 4 September 2011  
**National Literacy and Numeracy Week**

[www.literacyandnumeracy.gov.au](http://www.literacyandnumeracy.gov.au)

5–8 September 2011

**GraVisMa 2011**

International workshop on Computer Graphics, Vision and Mathematics  
Ostrava, Czech Republic  
[www.gravisma.eu](http://www.gravisma.eu)

10–13 September 2011

**2nd International Conference on Mathematics and Information Science**

Sohag, Sohag, Egypt  
<http://naturalspublishing.com/sohag2011>

16–18 September

**MANSW Annual Conference**

[www.mansw.nsw.edu.au](http://www.mansw.nsw.edu.au)

19 to 23 September 2011

**16th Asian Technology Conference in Mathematics (ATCM 2011)**

Bolu, Turkey  
[www.atcm2011.org](http://www.atcm2011.org)

15–17 November 2011

**CoSMEd 2011**

4th International Conference on Science and Mathematics Education  
Penang, Malaysia  
[www.recsam.edu.my/cosmed](http://www.recsam.edu.my/cosmed)

1–2 December 2011

**MAV Annual Conference**

[www.mav.vic.edu.au](http://www.mav.vic.edu.au)



Top left: Delegates in a workshop. Top right: Delegates gathered at the Presidents’ Reception.  
Bottom left: Conference dinner. Bottom right: AAMT staffers Melinda Pearson, Kate Manuel and Toby Spencer.

