

ABSTRACTS

Keynote Address

Catering for diversity

Megan Jackson – University of Canberra

The Australian Teaching Standards describe many aspects of teaching practice. Standard 1 focuses on knowing our students and how they learn. In attempting to unpack Standard 1, my presentation today examines recent research in the area of catering for specific educational needs in the area of Mathematics. This research includes work in Indigenous Education, English as an Additional Language or Dialect, and more generally in the inclusive education environment. Additionally, I will examine the research through the lens of the Quality Teaching Model.

Megan left her Year 11/12 classrooms to come over to the University of Canberra, where she joined the Clinical Teaching Specialist team in July 2012. She is a chef by trade, and also has an Arts degree, so her teaching areas cover Home Science, English, History & Political Science. When she isn't teaching, Megan is probably working on her PhD, which is about students with critical and chronic illness, real-time two-way digital communications, and motivation & engagement.

Workshops

Topics in Cryptography

Zoltan Bacskai – Defence Science Technology Organisation

This presentation will start out with some historical and 'simple' encipherments, and progress from there. Maths and puzzle enthusiasts may have already mastered this stuff, but there's a wealth of variations and complications. Both the problem-solving and computational aspects of cryptography will be illustrated, and its increasing dependence on advanced mathematics. Foremost though, Zoltan is an example of someone who's now enjoyably and gainfully employed to do maths all day.

The Power of the Preposition: a little on literacy, a lot on language – and sum numeracy two/to/too?

Valerie Barker – University of Canberra

The role of the English language in the development of mathematical understandings is crucial. Yes, we do have to teach reading! This is an anecdotal sharing of some of the characteristics, problems and peculiarities our language presents, not only for our EALD students, but for all students and teachers, recognising that problems in mathematics often stem from problems with language. Valerie is a Mathematics and English teacher with over 40 years' teaching experience in New Zealand, the UK, Brunei and Australia. She is currently working as a Clinical Teaching Specialist seconded to the University of Canberra in their undergraduate Primary and Secondary Education courses, and the developing M Teach (Secondary) course.

What is happening in Mathematics in Australia?

Margaret Bigelow – ACARA

The Australian Curriculum has many aspects that some teachers may find surprising. This presentation will alert you to initiatives that are happening around the country, the updated Work Sample portfolios and how these may assist in assessment schedules and innovative ideas. Margaret is the Senior Project Officer: Mathematics for the Australian Curriculum Assessment and Reporting Authority (ACARA). She has worked over the last four and a half years developing the Australian Curriculum for Mathematics from F-12.

A plethora of quadratic stuff on the iPad

Russell Brown – Texas Instruments

In this session we will look at using the TI-Nspire CAS iPad App to teach quadratic equations and graphs in a variety of interesting ways that also allows the visual and kinaesthetic learners to develop an understanding of the underlying algebraic methods. Participants will create parabolic shapes, take images with the built-in camera, model these shapes using quadratic functions and link back to standard algebraic techniques. Russell is an Educational Consultant who has presented widely in both Australia and overseas on the use of Computer Algebra Systems (CAS) technology in the classroom.

Enrichment opportunities

John Carty – BSSSS

In this talk John wishes to point out the opportunities for Enrichment that are available in Canberra/ACT region. John is the former ACT Director of the Australian Mathematics Olympiad Committee (AMOC). He carried out this role for 16 years.

Making worksheets digital

Tony Collison – School Software

Making your own interactive Excel worksheets is a simple enough process and a great activity for students as well as teachers. Tony is a seller of software, including Maths Resource Studio 5 and also of hardware. Formally a HT PDHPE teacher in NSW schools, he is now a retrained Maths teacher entering his 5th year.

Catering for diversity in Algebra classrooms with wireless technology

Tobias Cooper – Texas Instruments

In this workshop participants will see how the TI Navigator software can be used to integrate assessment for learning strategies into a variety of Algebraic concepts. Participants will be equipped with the TI-Nspire CAS calculators that communicate wirelessly with the Navigator software, allowing for assessment of students on the fly throughout a Mathematics lesson. This technology allows students to input mathematical symbols in their solution! Tobias is Mathematics Coordinator at De La Salle, Revesby NSW, and has been teaching secondary Mathematics for 18 years. His passion is integrating technology with contemporary pedagogy into Mathematics lessons to increase student achievement and engagement.

Tweet about the conference:

#canberramaths2014



Sharing resources and ideas for high-school Maths

Michael Denmead – Lyneham High School

Teachers are asked to bring with them an activity that they have found has worked in their high-school classroom. Activities will be shared with a view to using them in our classrooms. It would be beneficial to bring along activities that are easy to explain and will not take long to present to participants in the workshop. I trained as a Physical Education Teacher but always had a strong love of Maths. As a PE teacher I got the opportunity to teach some lower-ability classes. In 2004, the Dept of Education was trying to build its numbers of Maths teachers by offering a Graduate Certificate in Secondary Maths, so I took that opportunity and was very fortunate to have Steve Thornton, Bob Bryce and Malcolm Brooks as lecturers.

HOTmaths: interactive on-line maths learning

Christine Devine – Cambridge University Press

Cambridge HOTmaths is a comprehensive mathematics learning system — an interactive online maths learning, teaching and assessment resource for students and teachers, for individuals or whole classes, for school and at home. All attendees will receive a free HOTmaths trial account valid until February 2015.

Catering to mathematically gifted students in primary classrooms

Caroline Evers – Dickson College

Find out who 'gifted' students are, and why they need differentiation. Look at options for differentiating, including working within a mainstream classroom, groupings outside the regular classroom and acceleration. Discuss a variety of competitions that can keep students engaged, including some that give work they can do after they have finished class work. If time allows, try some enrichment questions in teams. Caroline has worked for a decade with mathematically gifted students at Kaleen Primary. She is currently teaching Maths at Dickson College, but still maintains a passion for gifted education.

Inclusive Mathematics education in primary classrooms – identifying effective approaches

Rhonda Faragher – ACU

In this presentation, participants in a research study will describe classroom practices they have found effective in teaching mathematics to learners with Down syndrome in inclusive primary classrooms. Opportunities for discussion and sharing tips will be provided. Rhonda and colleagues are undertaking a research study investigating effective approaches to inclusive mathematics education for learners with Down syndrome. Rhonda is Head of Education on the Canberra campus of ACU.

Who are we? A mathematical inquiry

Bruce Ferrington – Radford College Junior School

Many primary classrooms start the year with a unit that looks at “Who We Are”. How much of this investigation can be enhanced by mathematical inquiry? What insights can we gain by using mathematical elements to find out more about ourselves? Come prepared to do serious cutting and pasting, a bit of lying down on the floor and some intense circle time. Bruce is a Year 5 teacher at Radford College in Canberra. He has been teaching for 30 years.

Mathspace: integrating technology with rigorous mathematical learning

Erin Gallagher – Mathspace

Don't think that current mathematics learning technologies can reinforce quality learning of mathematics? Then you must see what Mathspace offers! Still the only Mathematics Learning Technology in the world that offers line by line personal feedback and marking. Imagine being able to snapshot each of your students' strengths and weaknesses in a few seconds. Imagine an online maths tool that taught students how to set out their working. Mathspace is a structured and thorough maths teaching and learning tool suite, not a simple multiple choice program or game.

Note: Bring your iPad or laptop along to experience the next generation in e-learning tools.

Catering for students with critical and chronic illness

Megan Jackson – University of Canberra

In this workshop we will examine some of the key aspects of working with students with critical and chronic illness. This will be an active workshop, based around small-group learning.

The future of Maths education: personalise, adaptive and gamify

Priteen King – Mangahigh

Manga High is an online Maths resource for Grades K-10 that allows teachers to cater for the diverse demands of today's classrooms. Teachers are supported with easy differentiation and reporting whilst students enjoy the engaging and adaptive online maths games.

Same task, different results: performance and strategy differences when students solve tasks on an iPad

Tom Lowrie – University of Canberra

This presentation examines Grade 6 students' performance and strategy preference when solving mathematics tasks, presented via pencil-and-paper and iPad modes. The students' performance differed across a number of the tasks – some in favour of the pencil-and-paper mode, others the iPad mode. Students who possessed higher spatial ability were more likely to solve the tasks correctly. The implications of the study are timely given the fact that high-stakes tests are likely to be presented in a digital form in coming years.

Follow us on Facebook:

Canberra Mathematical Association



Triple maths learning for the cost of a textbook

Justin Matthys – Maths Pathways

What would you say if there was an easy way to triple maths results and save teachers time – and it cost no more than your current text book? Two Aussie teachers have made this a reality by doing three things: i) precisely identifying each student’s learning needs; ii) providing high-quality personalised instruction and assessment; iii) enabling any teacher to do this in their classroom with an easy-to-use, comprehensive online system. Justin Matthys is cofounder of Maths Pathway. He is a 2014 Echoing Green Fellow, and is an alumnus of the Teach For Australia program. He has also taught Mathematics and Physics at secondary and tertiary levels, and conducted astrophysics research into dark matter.

Trebuchets

Jamos McAlester – Questacon

The Questacon Technology Learning Centre (QTLC) at Deakin offers engaging, hands-on workshops in the purpose-built Maker Space. Each workshop poses a different challenge where students explore Science, Maths, Design and Technology. We’ll let you loose with our miniature siege engines, and explore ways to connect the maths hiding in this medieval machinery. The QTLC Makers are energetic and engaging presenters responsible for developing and delivering the workshops and events offered at the Questacon Technology Learning Centre.

Shaping lifetime financial health for your middle-school students

Anne Nunan – Griffith University; Financial Basics Foundation

Being financially literate empowers people to make informed choices. The F-10 Mathematics Curriculum offers a significant opportunity for teachers to support all of their students by using financial literacy as a context for a range of mathematical operations and applications. This workshop will focus on exploring ESSI Money - an engaging online interactive game where students are given the opportunity to make virtual financial decisions. Anne has been a strong advocate for financial literacy in the secondary curriculum for many years. She is also currently working in post-graduate teacher education at Griffith University in Queensland.

Refugee maths

Ros Phillips – Dickson College

Refugee students have diverse backgrounds, and many have had years of disrupted schooling, due to life on the run and in refugee camps. Kathryn’s class offers mathematical support, encouragement and a variety of learning opportunities. Many students continue to attend the refugee Maths class after they have transitioned to a mainstream class, to receive additional support. Dickson College runs a refugee bridging program to help refugee students settle into Australian schooling and Australian life.

Teaching ideas for Geometry

Maria Quigley – University of Sydney

The Learning across the Curriculum content in the new Australian curriculum contains the General Capabilities, which include Critical and Creative Thinking, Literacy and ICT. The teaching and learning of many geometry concepts lend themselves to the incorporation of these capabilities. This session will provide you with a variety of simple teaching ideas that link to these capabilities and will engage your students in understanding geometry. These will include hands on activities using paper, cardboard, straws and more. It will also include ideas that utilise technology for both iPads and computers.

Snapshot on authentic concept development in the upper-secondary classroom

Ed Staples – Canberra Mathematical Association

I have come to the view that good teaching always contains a narrative. It is the narrative of human endeavour that resonates within us and holds our attention. Good teaching aims at developing basic concepts through the eyes of the mathematicians who first created them. Their solutions provide the best possible story for the classroom and deeper understandings are realised through that journey. Examples will be referred to in the 15-minute snapshot, but further reading will be provided in the handout.

Home-made YouTube-style educational videos

Paul Turner – Canberra Mathematical Association

I began this project with a view to testing the idea that one could make videos for mathematics teaching using readily available materials and hardly any sophisticated technologies. A model and inspiration for this enterprise continues to be the work of Vi Hart, whose YouTube videos are well-known. My own examples use little more than a mobile phone, a digital camera and a presentation program that enables slides to be saved in video format. The real challenge is in making the content interesting and informative for students.

SCRATCH: creative computing – prepare to be surprised

Bronwyn Welch – CSIRO; CMA President

This workshop is an introduction to SCRATCH. Developed by MIT (free computer download), SCRATCH helps young people learn to think creatively, reason systematically, and work collaboratively — essential skills for life in the 21st century. Through a directed exploration approach, with Coordinate Geometry as the focus, you will be introduced to the Scratch environment, work on a simple task and walk away with ideas for a “first lesson” for Year 7 (or Years 4-8) and ideas for further exploration for other year levels. Bronwyn has been a Mathematics teacher (Years 7-12) in Canberra for the past 10 years. She has a specific professional interest in engaging students in mathematics as a way of seeing and understanding the world: not just as a skill or a tool but as a way of thinking.

Colouring maps on impossible surfaces

Chris Wetherell – Radford College and ANU Secondary College

In 1852, Francis Guthrie noticed that with only four colours it is possible to colour in a map of England so that no two adjacent counties share the same colour. And this raised the question: is four colours always enough, no matter how complicated the map is? The answer is a resounding: er... yes, we’re fairly sure it is.

Guthrie’s question can also be asked when the map is drawn on more-complicated surfaces: for example, how many colours are needed for maps on a torus (donut) or on more mysterious objects such as a Klein bottle (‘impossible’ donut)? Curiously, the answer for all other surfaces is even more resounding: that one we definitely

know! This talk will discuss some of the basic ideas in the formulation and solution of these problems, drawing on concepts from graphs and networks (Mathematical Applications/Specialist Mathematics) and the classification of closed surfaces (ANU Secondary College/ Extension). No background knowledge will be assumed.

Transforming students’ Maths anxiety?

Sue Wilson – ACU

This session describes how a lecturer/researcher and a student counsellor worked together to develop a small-group Maths anxiety workshop for pre-service teachers. This collaboration led to greater understanding of the issues and obstacles faced by students. Some workshop activities will be presented; and ways the workshop may be re-designed for school students will be discussed. The outcomes for participants will be understandings of student anxiety warning signs; a workshop model that is generalizable to other situations; and a handout with useful resources.

If you would like to join us for dinner at a local restaurant this evening, please put your name on the list at the Registration desk. We would love to get to know you better in a more casual environment.

The CMA Committee