



Autumn 2014

## Centre for Research in Mathematics Education

### Newsletter No. 4

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#### Welcome

The start of the new academic year has brought with it some changes in the Centre, with Marie Joubert moving to the African Institute of Mathematical Sciences in Cape Town and Diane Dalby now supporting several research projects in the Centre as a Senior Research Fellow. Claire Clemmet and I have become Assistant Professors and Jeremy Hodgen will shortly be joining the Centre as a new Professor. You can read more about him and his varied research interests below.

In this issue, Claire Clemmet outlines some new developments in the PGCE course and Geoff Wake describes two research projects which are currently underway here. David Martin offers us an insight into the work of the Joint Mathematical Council, and one of our part-time PhD students, James Calleja, who is a teacher in Malta, writes about his study into the implementation of inquiry-based learning in mathematics classrooms.

If you have suggestions of items for inclusion in future newsletters, please email me. I would be delighted to hear from you.

**Colin Foster** [colin.foster@nottingham.ac.uk](mailto:colin.foster@nottingham.ac.uk)

**Editor**

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#### New Professor

Hi, I'm Jeremy Hodgen. I will be joining CRME in November as Professor of Mathematics Education. I have a wide range of interests in mathematics education, including assessment, teacher education, pedagogy and improving attainment and equity in mathematics education. I am currently particularly

interested in tackling low attainment in mathematics education.

I was joint-coordinator of the Economic and Social Research Council's (ESRC's) Targeted Initiative in Science and Mathematics Education (TISME). I also led the ESRC's Increasing Competence and Confidence in Algebra and Multiplicative Structures (ICCAMS) study (<http://iccams-maths.org/>). In ICCAMS, we replicated the 1970s Concepts in Mathematics and Science Study (CSMS) and investigated the implementation of formative assessment at Key Stage 3. Recently, I led two influential comparative studies, both funded by the Nuffield Foundation, which demonstrated that participation in post-16 mathematics in England is extremely low in comparison to almost all other educational systems.

I have just started work on a study of grouping practices and an extension of ICCAMS study in Scotland with Aberdeen University. I am working with Jill Adler in Johannesburg on a project to improve South African secondary teachers' subject knowledge ([www.wits.ac.za/WitsMathsConnect](http://www.wits.ac.za/WitsMathsConnect)).

I am an editor of *Research in Mathematics Education* and am coordinating the Algebraic Thinking Working Group at CERME-9 in February 2015 ([www.cerme9.org/](http://www.cerme9.org/)). My publications for teachers include a best-selling pamphlet on formative assessment, *Mathematics Inside the Black Box*.

At King's College London, I teach at all levels of postgraduate study, PGCE, MA, EdD and PhD. I am particularly interested in building capacity in quantitative methods. I was Director of Research and the first co-leader of the Centre for Research in Science and Mathematics Education (CRESTEM). Prior to academia, I taught in primary and secondary schools in London.

I am very much looking forward to joining and collaborating with CRME. See you in November.

**Jeremy Hodgen**

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## **News from the PGCE**

As you are aware, last year ITE had a very successful Ofsted inspection. One aspect of the course that was commented on was 'the very strong integration of theory and practice, informed by the most up-to-date and relevant research, enabling trainees to gain an in-depth understanding of the latest developments in education and their subject'. The PGCE has long been supported and enhanced by the involvement of CRME researchers through seminars and university sessions. Not content to rest on our laurels, this year we have a further development which we hope will enable our students to gain even greater insight into current research projects and see how this can be of use in their teaching.

At the beginning of the PGCE our students will have the opportunity to join

one of four CRME Electives where they will find out more about the work of one of the researchers involved. They will meet regularly as a group throughout the year to explore this area of interest and engage with it as learners themselves and as beginning teachers. As they begin to teach more lessons, they will be able to try out ideas they have explored with the researcher in their own lessons and then be able to reflect and feed back to their group what happened and how this informed their emerging ideas about how pupils learn best. The students will then collate their research and experiences and present their findings back to the other students in June in a conference. We hope to invite beginning teachers across our different training routes to this conference so that they too can benefit from the work done this year.

**Claire Clemmet**

**PGCE Link Tutor**

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### **Project Focus: Motivating learning**

Many of us find maths inherently interesting – as do some of our students. However, others don't - for many reasons. We are currently involved in two projects that take different approaches to supporting teachers to work with their students in ways that might help with this problem.

**MaSciL** (Mathematics and Science for Life) is an EU-funded project that involves 13 countries. It aims to support enquiry as a way of working in maths and science classrooms and also to provide insight into the use of mathematics in the world of work. It is hoped that these two aspects of working mathematically might motivate those students who ask "What's the use of maths?"

So far the project has developed a range of materials for use in the classroom and a toolkit to support teacher groups who want to explore working in this way. You can find out more about the project at [www.mascil-project.eu](http://www.mascil-project.eu) If you want to get involved, see below.

**LeMaPS** (Lessons for Mathematical Problem Solving) is based here in England and funded by the Nuffield Foundation. It is supporting a number of Lesson Study partnerships in which teachers are working with their classes on developing mathematical problem-solving skills. The project is very fortunate to be working closely with the project IMPULS in Japan that is promoting problem solving in Japanese schools. The link [www.lemaps.org](http://www.lemaps.org) will lead you to more details of this project.

If you, either on your own or with colleagues, are interested in working with us on either of these initiatives we would be very interested in hearing from you. Please contact [geoffrey.wake@nottingham.ac.uk](mailto:geoffrey.wake@nottingham.ac.uk) or any of the

Nottingham team with whom you currently work.

**Geoff Wake**

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## **CRME and BCME**

In the spring 2013 edition of this newsletter, Professor Andy Noyes outlined the excellent work of the Advisory Committee on Mathematics Education (ACME, of which Andy is Deputy Chair). In this article I will introduce the related Joint Mathematical Council of the UK (JMC) which, together with the Royal Society, set up ACME in 2002.

The JMC is a Council of 19 Participating Societies and 14 Observing Organisations. It meets three times a year for updating on mathematics education and to make joint responses to Government and other bodies. Recent responses made have included requests to extend for a year the reform of GCSE and A level mathematics to give time for these key developments to be carefully considered. We were delighted when, following the JMC and others' responses, an extra year was allocated for the reform of A level Mathematics.

Many of us may belong to one or more of the JMC Participating Societies as, for example, five of these are the Association of Mathematics Education Teachers, Association of Teachers of Mathematics, British Society for Research into Learning Mathematics, The Mathematical Association and NRICH. The full list of Participating and Observing organisations can be viewed at [www.jmc.org.uk](http://www.jmc.org.uk).

Every four years the JMC Participating Societies hold a British Congress of Mathematics Education (BCME) conference, which was last held in Easter 2014 at the University of Nottingham. A number from CRME attended and Professor Malcolm Swan gave the well-received closing plenary. The next conference in 2018 may seem a long time away but those involved in conferences will understand that planning will soon be underway to select a venue and decide on its structure and theme. Ideas will be most welcome.

**David Martin** [david.martin@nottingham.ac.uk](mailto:david.martin@nottingham.ac.uk)  
**Chair of the BCME Committee of the JMC**

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## **PhD Focus: Inquiry practices through professional development**

Notwithstanding the numerous initiatives to support teacher development in Malta, one aspect that seems missing is opportunities for ongoing collaborative professional learning. For the past 20 years I have been teaching mathematics at a secondary school in Malta where I am also a head

of mathematics department, collaborating with teachers on various curricular aspects. Currently, I am into my second year as a part-time PhD student at Nottingham. My study involves the design of PD materials for teachers of mathematics interested in learning about and implementing inquiry-based (IB) pedagogies.

This project involves two phases: PD sessions and ongoing teacher meetings. The PD sessions, held prior to the start of the school year, take the form of workshops intended to provide teachers with opportunities for collaborative discussions around inquiry practices. Workshops are aligned with research-based inquiry principles, namely: a task-based approach to teaching, collaborative learning, divergent questioning, and student agency and responsibility. Sessions involve teachers working on mathematical tasks and critically evaluating videos of lessons showing how teachers enacted the same tasks in local classrooms. The idea is for teachers to experience inquiry and collaboratively construct knowledge about it – asking questions and seeking answers, exploring and explaining pedagogical practices. The teacher meetings are then aimed towards providing teachers with ongoing opportunities to discuss and evaluate their classroom practices. During this period, while teachers are in schools, I intend to observe and video record lessons that teachers may want to share with the rest of the group, and use these as learning opportunities. Teachers may opt to discuss pedagogical issues and challenges that may arise as a result of the inquiry-based tasks and practices that they decide to adopt.

This year involves piloting the PD materials and the data collection instruments with a group of five teachers. Following that, I intend to carry out the main study with a larger group of teachers. If you would like to take a look at some inquiry-based learning tasks trialled by teachers at my school, kindly visit: <http://investinmathsense.wordpress.com/>

**James Calleja** [ttxjc48@nottingham.ac.uk](mailto:ttxjc48@nottingham.ac.uk)

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## **CRME seminar programme**

We have three CRME seminars coming up:

- Thursday 25 September 2014  
5.00-5.30 pm The mathematics education community and the government  
Professor Andy Noyes, University of Nottingham
- 5.30-6.15 pm Making our goals a reality in our classrooms  
Professor Alan Schoenfeld, University of California, Berkeley
- 4.00 pm Monday 20 October 2014  
What can and should we learn from international studies of mathematics achievement?  
Professor Frederick K. S. Leung, Faculty of Education, The University of

Hong Kong

- 4.00 pm Wednesday 12 November 2014  
Discrete or continuous change: Can a dynamic representation facilitate development of reasoning in mathematics?  
Dr Sue Forsythe, University of Leicester

We would love to see as many people as possible at these. Normally we have dinner afterwards with the speaker, and everyone is very welcome to come along. If you are not receiving notifications of these events, and would like to be, please get in touch with Mat Crosier [Mathew.Crosier@nottingham.ac.uk](mailto:Mathew.Crosier@nottingham.ac.uk).

### **Colin Foster**

If you have any comments regarding this newsletter, or would like to be added to or removed from our mailing list, please contact [mathew.crosier@nottingham.ac.uk](mailto:mathew.crosier@nottingham.ac.uk). Previous newsletters can be found at [www.nottingham.ac.uk/education/research/crme/crme-news.aspx](http://www.nottingham.ac.uk/education/research/crme/crme-news.aspx). The editor is Colin Foster.