Newsletter Issue 2: March 2014

Welcome to the second **sigma** e-Newsletter.

Contents

New sigma Network Project Manager

Moira Petrie

Moira Petrie has been appointed as the Project Manager for the HEFCE funded **sigma** Network programme. As some of you know, Moira has been involved with the mathematics support community since 2007, when she joined **sigma** CETL as Assistant Director. She continued as Assistant Director of the National HE-STEM Programme funded **sigma** Network project before going on maternity leave in the summer of 2011. As such, Moira brings with her a comprehensive understanding of the **sigma** programme. She joins us from the Faculty of Engineering and Computing at Coventry University, where, as Senior Lecturer (STEM Student Support), she was responsible for the development of peer assisted learning and mentoring initiatives.

> *"I am really pleased to be re-joining the **sigma** network. The mathematics support community continues to be so welcoming and supportive and I believe we can build on our existing successes to expand and further strengthen this community and its resource base. I am looking*

forward to meeting old and new friends over the coming two and a half years."

Moira took up the post on 3rd February 2014 and is based at Loughborough University. Currently her working days are Monday and Tuesday and she can be contacted on mailto:mm.g.petrie@lboro.ac.uk.

Integrating across known domains

David Bowers, Chair sigma Network

David Bowers

The rather tortured title to this report is an attempt to find a mathematical metaphor for the work of the **sigma** Network of regional hubs. By dividing the country into six geographical areas, and establishing a regional co-ordinator in each, **sigma** is able to offer a way for tutors running mathematics and statistics support to more easily make contact with peers in similar institutions locally. To date, this has worked to good effect.

The benefits of regional hubs go beyond the saving of travel time and costs when meetings and events are run locally rather than nationally. However, this benefit is particularly relevant in these times of restricted resources. The regional hub co-ordinators keep in regular contact and share plans for events, so that an activity that worked well in one region can be replicated elsewhere for people in a different part of the country, at minimal extra development cost.

Another benefit of the regional hubs is the way in which informal local networks of practitioners can spring up, willing to continue to share ideas and experience with people "down the road" beyond the formally arranged **sigma** events. Despite the "competition" that might exist at institutional level, professionals involved in grass-roots maths and statistics support know that the numerical and quantitative skills of ***all*** tomorrow's graduates is of prime importance for society.

So when you are contacted by your regional **sigma** hub co-ordinator with news of a meeting or requesting suggestions for future events, please treat this as an opportunity to get involved and help shape the quality of maths and statistics support in your area. This newsletter, and the **sigma** Network website, contains information about events already in the pipeline. Please give them your support.

A full list of the regional **sigma** hubs and the institutions covered by them is on the website at: www.sigma-network.ac.uk/hubs/.

Joe Kyle's Corner - Winter Olympic Daydreams

Joe Kyle

Joe Kyle

Not a great fan myself - seems to have much of the morbid fascination of motor sport that amounts to watching adrenalin-busting tasks that involve quite a lot of crashing and falling. But I am fascinated by the scoring systems. Some involve pure subjectivity - a topic for another day, perhaps. But other Olympic events involve reconciling scores (marks) from quite different sports in a multi-discipline event.

So how do you score a decathlon? How do you take the distance a shot put is thrown and compare it with the time for 400 metres? Well at least they don't do the really foolish thing and take the mean; that would be, in the

language of sports commentators, just dumb wouldn't it? What actually happens, of course, is that mathematical formulae are used - rather simple formulae, at that. Then they use the formulae to produce nearly 200 pages of tables that (usually non-mathematical) judges consult! (See http://www.iaaf.net)

The principle that raw data may need sensible, transparent adjustment to achieve fairness is one that I know many colleagues use in dealing with student marks; I'm just surprised that it is often seen as controversial. Perhaps it's a consequence of the mad metrics of modularity: if you believe that the content of every module weighs an exact multiple of 30 credits (or whatever) and that each module at that level is precisely as hard (no more, no less) as every other then you will do the 'dumb' thing and take the mean.

Snippet from Winter Olympics commentary: "*That's not a multiple of 180 degrees - get your protractor out and check!*"

sigma funding opportunities

More funding opportunities with sigma

The HEFCE funding we have received will help us fund the following two initiatives over the coming months:

- **resource development funding call**
  This will focus on the development and production of resources which will be made available to the community through **math**centre.ac.uk and **stats**tutor.ac.uk. This year, we are hoping to award 5 grants of £2,000 each. Details of the call will be available on the sigma-network.ac.uk website in late March.

- **student summer internship programme**
  Following the success of the student internships funded under the National HE STEM programme, we will be offering funding for 6 student summer internships for this coming summer, where undergraduate students are employed to work on developmental projects relating to mathematics and statistics support. We are hoping that one internship will be allocated to each hub region. Details of the scheme will be published on the website shortly.

New centres initiative / centre enhancement initiative

In the first call for **sigma** funding for new centres/enhancement of existing centres we received 14 applications - 7 for new centres and 7 for enhancements to existing centres. The panel is currently scrutinising these and successful applicants will be announced on **Friday 14th March** and an induction day for the new centres will take place on Friday 28th March at the University of Birmingham.

As was made clear in the Call, priority will be given to funding entirely new centres. If an insufficient number of applications in this category are deemed fundable then some or all of those in the enhancement category will be invited to submit full bids. A second call for a further five new centres will be made later in the academic year 2013/14.

For further information please go to the sigma Network website or contact Moira Petrie.

Chetna Patel – North East & Yorkshire Hub co-ordinator

Chetna Patel

Chetna has been Manager of the Maths and Statistics Help Centre at the University of Sheffield since February 2008. In this role she has responsibility for managing the service and the delivery of maths and statistics support. Prior to this position she was doing similar work at the Robert Gordon and De Montfort Universities. She has been working in HE for 18 years but began her career in teaching as a Primary School Teacher.

Chetna recently achieved a PhD where she explored the effectiveness of mathematics support on mathematical performance. Her current research interests lie in how students, who for various reasons view mathematics as inaccessible, can be reintroduced to it. Her hope is that this introduction will help students develop a personal meaning of mathematics which would be a precursor for developing their mathematical skills.

She has been involved with **sigma** from its early days and is currently the **sigma** North East Regional Hub coordinator. This role involves helping mathematics and statistics practitioners to network for support, guidance and sharing of resources.

Ruth Fairclough – Midlands Hub co-ordinator

Ruth Fairclough

Ruth has 10 years' experience teaching mathematics and statistics in Higher Education for undergraduate and postgraduate mathematicians and service teaching mathematics for engineers and computer scientists. Although a relative newcomer to Maths Support Centres Ruth has been involved in mathematics support for students across the Faculty of Sciences and Engineering from the start of her career in Higher Education. She played a role in setting up the University of Wolverhampton Maths Support Centre in April 2012 for students across the University using **sigma** funding.

Ruth has recently taken over the lead of the Midlands Hub, and is looking forward to organising a number of regional and national events and providing mentoring to new maths support centres at other Universities.

CETL MSOR Conference, Cardiff University, 8/9 September, 2014

In 2009, sigma explored the growing use of technology in mathematics and statistics support [i]. Five years on, technology has advanced and new ways of exploiting it are emerging (for instance MOOCs, mobile apps, flipped classrooms). We are entering a period of educational experiment and disruptive innovation. This year's conference will explore ways in which learning, teaching and support in Mathematics, Statistics and Operational Research in Higher Education are being shaped by the opportunities arising through a more connected world.

The principal themes of the conference will be:

- Technology-enhanced learning and teaching,
- Back to basics! The lasting value of face-to-face interaction
- Offering mathematics and statistics support through technology
- Harnessing the power of social media for improving student engagement
- Whither (wither !) the traditional lecture - evolving your teaching to keep pace with a more connected world

Interesting contributions from other areas of learning and teaching of MSOR will also be welcomed.

The call for abstracts will be announced shortly.

[i] Lawson, D.A., Carpenter, S., and Croft, A.C. (2009) '*Mathematics support: real, virtual and mobile*', International Journal of Technology in Mathematics Education 15(2).

Creating and maintaining a social media presence, 20 June 2014 sigma North West and North Wales Hub Event

Leslie Fletcher

The **sigma** North West and North Wales Hub is holding an event, *Creating and maintaining a social media presence*, at Liverpool John Moores University on Friday 20 June.

In the morning LJMU's Alex Spiers will give an introduction to Twitter &c. This is something he does on HEA training courses so he is in a good position to guide novices. Janette Matthews, who looks after the **sigma** network website, will talk about the use you can make of the website to share news and information. In the afternoon there will be an opportunity for presentations from colleagues around the UK on the uses they are already making of social media in mathematics and statistics support.

Leslie Fletcher, the Hub co-ordinator will put out a general call for contributions on the **sigma** JISCmail list http://www.jiscmail.ac.uk/sigma-network but would be delighted to receive suggestions right away (L.R.Fletcher@ljmu.ac.uk).

Sustainability and Evaluating Success: sharing good practice News from the sigma South East Hub

Noel-Ann Bradshaw

On Friday 14 February the University of Greenwich hosted the first **sigma** SE hub event of this academic year. The event was e*ntitled 'Sustainability and Evaluating Success: sharing good practice'* and was designed to enable those involved in maths support in the region to get to know each other, share some ideas that work well and discuss any problems that people were facing.

The event was attended by those involved in maths support from several universities including Brunel, Buckinghamshire, Greenwich, Imperial, Kent, Kingston and Portsmouth.

During the afternoon discussions focussed on several issues including: the difficulties supporting those needing to learn statistics in other disciplines, obtaining feedback and evaluating provision, the use of university virtual learning environments such as Moodle and the problems associated with the staffing of sessions, timetabling and rooming. Those attending, felt that the afternoon had been very beneficial; enjoying the opportunity to network with like-minded and similarly challenged

Christine Pereira (Brunel), Mateja Presern (Portsmouth), Allison Smale (Buckinghamshire), Tony Mann (Greenwich), Nigel Atkins (Kingston)

individuals and obtain fresh ideas.

The meeting ended with everyone pooling ideas for future meetings, so lookout for details of the next event fairly soon. For more details about the sigma Hub in the South East contact Noel-Ann Bradshaw (n.bradshaw@gre.ac.uk).

The advantages and disadvantages of using PhD students for statistics support

Ellen Marshall

The Maths and Stats Help (MASH) centre at Sheffield University employs one full time statistics tutor and seven ad hoc PhD students to offer statistics support to students. The main advantage of employing PhD students is being able to maximise the number of appointments available to students without the use of long term contracts which are less cost effective during non-term times. Stats clinic runs most of the year usually with two tutors available. Opening hours and the number of tutors available can be adjusted according to demand at fairly short notice. Other advantages are being able to offer a wider range of expertise and being able to support and learn from each other.

The main disadvantages are that statistics tutors all need some form of training and the relatively short time each PGR tutor is with us. The training we currently offer is mostly on the job support which is time consuming and one or two staff training events. Most of our stats tutors are PhD students from the Statistics department so although their theoretical knowledge of statistics for continuous data is good, they need help adjusting to explaining project statistics without using maths as well as learning to use and teach SPSS.

We are very interested in hearing from others about support and training offered in their centres or elsewhere. Please email ellen.marshall@sheffield.ac.uk.

Report on the New Centre Call briefing day: Friday January 17th 2014

Tony Croft

On Friday January 17th 2014 **sigma** held a briefing day for those interested in submitting a bid to the Call for applications for funding for new mathematics/statistics support centres or enhancements to existing provision. Readers may recall that **sigma** has funding sufficient to enable five institutions to be supported over the next two years (up to £15k per institution) as they develop their mathematics and statistics support provision.

Despite serious travel disruption, affecting both St Pancras International and the M1, eleven delegates representing six English Universities and three Colleges with HE provision managed to make it to Loughborough for the event.

The day began with the background to the **sigma** initiative and a review of the rationale for providing mathematics support to students in higher education institutions. The vision for what **sigma** is trying to achieve during the period 2013-2016 was shared. Following a group activity in which delegates explained the needs of their own students and their ideas of local development of mathematics support, a Q&A session took place which hopefully cleared up any potential misunderstanding about the purposes of the funding and what it might be used for.

sigma Project Manager Moira Petrie, explained the purpose of the **sigma** network and the hub structure and strongly encouraged those present to link into and thereby strengthen the network.

Visitors were able to take advantage of a tour of the Loughborough Mathematics Learning Support Centre accompanied by graduate intern David Haines, followed by a visit to the Eureka Centre for Mathematical Confidence – led by Clare Trott - which offers additional mathematics and statistics support to those students who have additional needs.

Michael Grove provided the view of someone who was on the receiving end of the previous round of **sigma** funding for the establishment of a new centre at the University of Birmingham. There was an opportunity to learn more about ways in which bidders might secure more local support and seek institutional endorsement of their ideas, particularly by drawing upon the wealth of published information. The event closed by drawing attention to the bid criteria and emphasising the importance of writing a good, realistic bid which was supported by the senior management of the institution.

Presentation slides used during the day were made available to delegates immediately after the event, and are also available here (near the bottom of the page). The feedback received has been very positive, including:

> *"Thank you for these files. It was a very useful day, lots of good ideas here. Now to find the time to write the application!"*
>
> *"Thanks for organising the day: it was really useful and informative. Hopefully, we'll be able to get something together in time."*

The closing date for applications for this round of funding was 14th February. It is intended that successful proposals will be announced on 14th March. There will be a second, similar round of funding later this academic year..

Review of EDUC115N: How to Learn Math – Jo Boaler, Stanford University

Hazel Corradi, University of Bath

As a bioscientist supporting numerical and mathematical learning for undergraduate bioscience students, my only experience of maths teaching is what I received at school. Although I have tried to pick up tips on how to make classes effective over the years, I have not had any particular training in teaching maths. Also, as someone who enjoyed maths, I have not personally been on the same journey as my students who haven't done A-level maths and who have very low confidence levels.

Taking part in this MOOC from Stanford University really opened my eyes to the power of different approaches to engage maths-resistant students. The course was a mixture of psychology, classroom practice and maths puzzles and is primarily aimed at parents and school teachers. Even so, I found the content helped me to understand the rationale behind approaches to maths teaching and to reflect on my own experience.

The take home message of the course is that everyone can do maths, and that the biggest problem in school maths teaching is the expectation of teachers and students that some people can't do maths. There is also an emphasis on the benefit of setting challenging work and learning through mistakes. The most helpful part for me was the emphasis on drawing and conceptualising problems in different ways. I have often found it useful to draw problems and this course has prompted me to encourage students to do the same. Where possible, I also now try and encourage students to contribute different ways of approaching problems as this helps create a more inclusive classroom and builds their confidence to explore different ideas.

The course will be running again with provisional dates of April-October 2014. For more information

and registration, see
https://class.stanford.edu/courses/Education/EDUC115N/How_to_Learn_Math/about

Support Tip : Maths is like swimming

Leslie Fletcher, Liverpool John Moore's University (LJMU)


Leslie Fletcher

George Polya said something like this in his renowned book How to Solve It: "*Solving [mathematical] problems is a practical skill like, let us say, swimming*" I often embellish this, saying to students that, as with swimming, they will not learn to do mathematics by listening to somebody talk about it or by reading books about it.

Swimming taught me a different lesson. Having not learned to swim as a child, I was almost 50 years old before getting to grips with it. Now the tables were turned – I found learning to swim scary and difficult, which is how some students coming to maths support find, say, calculus. Like many (most? all?) university teachers of mathematics, I encountered no real difficulties in my undergraduate course – although my grasp of p-adic numbers was a bit feeble! To see mathematics from the point of view of a student struggling with epsilon, delta and what you do about modulus signs, I remember the times in the swimming baths when coordinating arms, legs and what you do about breathing seemed totally beyond me.

University of Kent Mathematics Support Centre

Allia Wilson
(A.M.Wilson@kent.ac.uk)

University of Kent | Student Learning Advisory Service

UELT

The University of Kent Student Learning Advisory Service (SLAS) provides advice and guidance for students to strengthen their study skills, or to discuss a specific study skills area. There was a perceived gap in what SLAS offered in terms of specific maths and stats support. With many students having a requirement and not necessarily strong maths and stats skills sets to draw on, SLAS evaluated the feasibility of running 'Clinics' during the academic year 2009-2010 in partnership with the School of Mathematics, Statistics and Actuarial Science (SMSAS).

The Maths and Stats Clinics are delivered through SLAS within the Unit for the Enhancement of Learning and Teaching (UELT). There is currently no dedicated space. Any student, on a programme of study involving an element of maths or statistics, who wants to improve their learning and understanding in a neutral, safe environment, is welcome to attend. The clinics are timetabled for a total of 8 hours per week on Wednesdays throughout the Autumn and Spring terms, and for the first three weeks of the Summer term.

The partnership with SMSAS ensures the sustainability of the scheme as current postgraduate students in SMSAS are used to staff the clinics, keeping costs manageable. The scheme offers postgraduate students valuable experience in teaching and support /guidance skills.

The Maths and Stats Clinics are advertised extensively, via the University's staff and student portals, by a poster campaign and through leaflets throughout the year.

They have developed into an integral and highly-valued part of the student learning support programme and there is a commitment from the University's UELT to support the development of this

provision in future years.

Advice to some starting up a new centre would be to:

- Just go for it. Persist and don't give up on your plans and dreams.
- Enlist the help and support of your line manager and colleagues higher up in the institution
- Show evidence of need.
- Get in touch with **sigma** and any other external bodies to explore various possibilities.
- Let passion, commitment, dedication and determination guide you in your endeavours.

If I had £1,000 windfall, I would spend it on:

- A dedicated space with a drop-in facility throughout the week.
- Employing more PhD students to teach in the clinics.

For more information including student feedback and quantitative data click here.

Conferences

HEA STEM Annual Learning and Teaching Conference 2014: *Enhancing the STEM Student Journey*

30 April -1 May 2014, University of Edinburgh
Registration is open now at the online booking page. Submissions are being invited for the conference poster competitions (for undergraduates, postgraduates and staff). The template for poster submissions is available online and the deadline for submissions is **Friday 24 January 2014**.

sigma CETL MSOR Conference

8-9 September 2014, Cardiff University

Events

Qstep inaugural event : Counting them in: quantitative social science and the links between secondary and higher education

17 March 2014 at the Royal Society, London

A one-day conference exploring ways to strengthen quantitative social science training through the links between secondary and higher education.

HEA STEM (Maths, Stats & OR): Using mathematical industrial problems with undergraduates: a hands-on experience

Wednesday 2 April 2014, University of Bath

Professor Chris Budd will lead this masterclass which will focus on using industrial problems with undergraduates in the Mathematical Sciences. For further information and to book a place, please go to the online events page for this masterclass.

HEA STEM (Maths, Stats & OR): E-Assessment in the Mathematical Sciences: Finding the formula for success

Wednesday 9 April 2014, Middlesex University
This workshop will provide a rich opportunity to explore the scope and potential of e-assessment

within the Mathematical Sciences. For further information and to book a place, please go to the online page for this event.

sigma Hub Event: Creating and maintaining a social media presence

20 June 2014, Liverpool John Moore's University

Workshops will explore the use of social media in mathematics and statistics support.

Recent reports and research publications

This regular column lists recent publications relevant to mathematics and statistics support practitioners. Where available, links are provided. If you are aware of any publications that may be of interest to this community, please will you send them to J.Matthews@lboro.ac.uk. It is our intention to compile a bibliography which will be available from the **sigma** Network and **math**centre websites.

Research publications

Alcock, L., Attridge, N., Kenny, S., & Inglis, M. (2014*). Achievement and behaviour in undergraduate mathematics: personality is a better predictor than gender*. Research in Mathematics Education, (ahead-of-print), 1-17. DOI:10.1080/14794802.2013.874094

Ciarán Mac an Bhaird, Olivia Fitzmaurice, Eabhnat Ní Fhloinn, and Ciarán O'Sullivan (2013). *Student non-engagement with mathematics learning supports,* Teaching Mathematics and its Applications, 32 (4), 191-205, doi: 10.1093/teamat/hrt018

Pettigrew, J., & Shearman, (2014) D. *Piloting an online mathematics and statistics tutoring service*. 30th ascilite Conference 2013 Proceedings, http://ascilite.org.au/conferences/sydney13/program/papers/Pettigrew.pdf

Nicole Scherger (2013). *The redesign of a quantitative literacy class: student responses to a lab-based format*, Teaching Mathematics and its Applications 2013 32(4), 206-213 doi: 10.1093/teamat/hrt003

The **sigma** e-Newsletter is a quarterly community publication and the views expressed do not necessarily constitute recommendations from the **sigma** Directorate.

We welcome contributions on any topic that may be of interest to practitioners and academics supporting higher education students in their learning of mathematics and statistics. Please contact Janette Matthews (J.Matthews@lboro.ac.uk). The deadline for the next edition is 16 May 2014.

For more information, visit http://www.sigma-network.ac.uk

or contact enquiries@sigma-network.ac.uk

The **sigma** Network gratefully acknowledges the funding it receives from HEFCE