



Issue 3: June 2014

Welcome to the third **sigma** e-Newsletter. **In this issue:**

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What does the sector need now in relation to mathematics and statistics support?

*Michael Grove, Associate Director **sigma** Network*

Mathematics and statistics support now forms a widely accepted part of higher education. The evidence for this is compelling. The '[Extent of Provision](#)' survey undertaken by Perkin, Lawson and Croft in 2012 found that "88 out of 103 responding institutions offered mathematics support provision" with 30 of these centres being classified as 'highly visible' which meant they were staffed for over 10 hours each week and had web pages providing information about mathematics support. Further, an analysis undertaken through the National HE STEM Programme indicated that a number of universities had explicitly referenced their mathematics and statistics support provision within their Office for Fair Access (OFFA) and Welsh Fee Plan agreements demonstrating a public commitment to supporting learners from all backgrounds make the successful transition to higher education study.



Michael Grove

Perhaps, however, the most compelling evidence for the emergence of mathematics support is its emergence as an area of research study in its own right. As the list of research publications at the end of this newsletter shows there is an ever increasing number of colleagues collecting data on the ways in which students (do or don't) engage with mathematics support, exploring optimal strategies to enhance delivery, and embedding evidence informed practices and approaches. They collectively represent a perfect example of the scholarship of learning and teaching.

Mathematics support has moved on from what might have been humble beginnings, and the work of **sigma** over this last nine years has been, quite rightly, supporting frontline practitioners. It is vital we continue to do so, but the mathematics support community is flourishing, and so the question "where, and what now" must be asked and answered. As a sector, what do we really need to move our activities in mathematics and statistics support 'to the next level', more precisely, how do we take a wider and more strategic view to addressing the mathematical difficulties of learners throughout their university studies?

Through this current period of activity **sigma** is working to explore existing and future high-level sector needs in relation to mathematics and statistics support. This includes, identifying both the support higher education institutions might welcome from the Higher Education Funding Council for England (HEFCE), and how the **sigma** Network can assist university senior management in ensuring that mathematics support provision continues to meet institutional needs in ways that are both fit for purpose and sustainable.

This work is just beginning, and we hope to be able to report on our findings in the autumn. In the meantime, anyone involved in mathematics support can help with this research. We are looking to speak with members of senior management (Pro Vice Chancellor level or equivalent) within higher education institutions to ascertain their views on institutional and sectoral needs, priorities and intentions towards mathematics and statistics support. Please encourage them to participate and make contact with one of the **sigma** Directors.

Spaces and places for maths support

*David Bowers, Chair **sigma** Network*

I recently gave a presentation at the annual conference of the Association for Learning Development in Higher Education (ALDinHE). According to ALDinHE's website, "*Learning Developers share a common desire to empower students in their learning through helping them make sense of academic practices within higher education and supporting them to acquire the generic underpinning skills for the environments in which they are working.*" I argued that mathematics and statistics belong very much to these "generic underpinning skills" that are essential for students. We know that it is no longer just STEM students who need maths – social scientists, nurses, economists and many more need to have increasingly high levels of quantitative understanding. And we also know that only around one in six non-STEM students have any experience of A-level maths. The importance of mathematics and statistics support is evident.



David Bowers

My conference presentation focused on ways in which maths support can, and indeed should, be integrated with other university support services, so that students benefit from a "joined up" provision without any implication of "remedial". Within universities across the **sigma** Network, there are examples of various ways in which mathematics and statistics support is structured and provided. By becoming involved with your regional **sigma** Hub, meeting like-minded colleagues at local **sigma** Hub meetings and keeping an eye on the **sigma** Network website and mailing list, you will be able to share experiences with other maths support practitioners and gain ideas that might influence and enhance your current work. We look forward to getting to know you.

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 - Magic, Mistakes and Myopic

Joe Kyle

A few weeks ago I became 64. To say I reached 64 would imply some achievement like climbing a mountain; and the word 'celebrated' is certainly out of the question. So I'm now 64 (and, for those who wonder, yes - she still needs me and yes - she still feeds me). So with square numbers in mind I thought about constructing a magic square involving the year 2014. Strictly speaking, a magic square should use numbers 1, 2, ... n^2 (which was never going to work) but a looser definition allows consecutive numbers N , $N+1$, etc. So I set about hunting for such a square where the rows, columns etc. summed to 2014.



Joe Kyle

Now with a bit of research I found that about a hundred years ago a chap called Zerr from Chicago had found some related results.

So, I started to explore (I'm not ashamed I used a spreadsheet to help me here). But something odd was happening - after a few efforts I had an example, really by trial and error. But Zerr's formulae were not in agreement. I was puzzled. Next morning, in better light, I worked through the simple expressions myself - and there it was: Zerr was wrong! Or so I thought, because when I enlarged the display all was clear: I had misread n^3 as n^2 . The man from Chicago was right; the mistake was mine. Thereafter all went swimmingly and I have a very nice magic square I'm quite proud of. And I'm pretty sure it's the only one (with positive whole numbers). I might even use it at an upcoming

workshop or conference, so I'm not telling you now! I also have the basis of a neat, if not too demanding, investigative workshop task. It is amenable to brute force but has shorter more elegant solutions. It can be generalised - 2015 and 2016 look good years, but 2017 is barren territory, as you might expect of a prime number.

Many years ago I decided to have nothing to do with magic squares. They had been done to death as an investigation in schools, where pupils were told (not taught) to parrot idiotic things like: you begin by putting a 5 in the middle - even when there was no middle! I don't blame teachers here. They were doing their best to deal with the latest ideas that flowed from politicians who paid more attention to ideology than evidence – now, I wonder what that reminds me of.

The moral of the story - well there are several. You can often brighten up quite standard mathematical topics via a contemporary twist involving the date, the year or even the news of the day. Check and double check by going back to original sources. But, for me, going back to the optician is a top priority - now that I'm older, losing my hair.

Come to Cardiff! More details on this year's CETL MSOR conference

This year's CETL MSOR conference is taking place at Cardiff University on Monday 8th and Tuesday 9th September 2014. It is being hosted by the University's College of Physical Sciences and Engineering, in the University's Queens Building.

The aim of this conference is to promote, explore and disseminate emerging good practice and research findings in Mathematics and Statistics support, teaching, learning and assessment. The conference will appeal to all those teaching Mathematics, Statistics or Numeracy, whether this is to specialist mathematics students or students studying components of mathematics within their degree programmes (such as bioscience, chemistry, computer science, economics, engineering, nursing, physics, psychology, social work, etc).

We are pleased to announce that our keynote speakers are Professor Dame Celia Hoyles (Institute of Education), Dr Colin Jones (University of Tasmania) and Professor Paul Harper (Cardiff University). Also following positive delegate feedback from last year's conference there will be a plenary session presented by students undertaking internships at a number of universities from across England.

The title of this year's conference is "Mathematics and Statistics Teaching, Learning and Support: Real, Virtual, Mobile" and its principal themes are:



- 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](#) is currently open and colleagues can submit an abstract for a 20 minute presentation, 60 or 90 minute workshop or a poster.



The **Millennium Stadium**, home to the Welsh Rugby Union and host to a wide range of major sports and music events, is the venue for this year's Conference Dinner. The evening of 8th September begins with an optional pre-dinner tour and pitch side drinks reception, followed by a three course dinner.

Accommodation for conference delegates is being provided by the **Park Plaza Hotel**, which is conveniently situated half way between the conference venue and the dinner venue (less than 10 minutes walk from both). We have some rooms available at the Park Plaza on the evening of Sunday 7th September for those of you requiring it. Please note that this is charged in addition to the conference delegate fee.

Delegate bookings are now open and can be accessed via this [link](#).

We look forward to extending a warm welcome to you in Cardiff!

sigma funding announcements

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. We are pleased to announce the four successful projects from our recent funding call. These are:

- **Kings College London**
- **University of Leicester**
- **Halesowen College**
- **Bournemouth University**

All four of these projects focus on the development of new provision and each will receive funding of £15,000 over two years. The planned provision will be in place for the start of the new academic year and all four projects are already busy making preparations. **sigma** will be offering the projects support throughout their funding period, specifically through the use of mentors. More details of the projects are available elsewhere in this newsletter.

Student summer internship programme

sigma, the national Network for cross-university mathematics and statistics support, is delighted to announce the six successful projects from our recent student summer internship funding call. These are:

- **University of Bath:** Developing resources to overcome specific language barriers in HE Mathematics and Statistics
- **University of Brighton:** Developing resources for mathematics and statistics on the University of Brighton Academic Study Kit (ASK)
- **University of Liverpool:** Creating online maths questions to enhance student learning in maths in a chemistry context
- **Liverpool John Moores University:** Designing a collection of practice questions to improve the numeracy, capabilities and confidence of pharmacy students
- **London Metropolitan University:** Data collection and analysis relating to usage of the maths support provision at London Met
- **Sheffield Hallam University:** Investigating ways to promote engagement with students from subject areas which are under-represented as users of Maths Support

Each project will receive a £2,000 grant, with the main purpose being to provide the student interns with experience of working on a time limited project. The outputs of the projects will be shared with the wider community. In addition, the students will be offered the opportunity to present their projects as part of one of the keynote sessions at this year's CETL MSOR conference. Details of the conference can be found [here](#).

Resource development

sigma is pleased to announce that the following projects were successful in the recent funding call for resource development projects:

- **University of Bath:** Emma Cliffe and Cheryl Voakes-Jones - *"Getting started with..."* screencasts and help guides

- **De Monfort University:** Eleanor Lingham - A bank of two-page 'bite-size' leaflets to provide targeted support to students who are preparing for numerical reasoning tests
- **Loughborough University / University of Sheffield:** Alun Owen and Ellen Marshall - A pack of "scenario-based" training resources that can be used for developing statistics advisory skills amongst mathematics support centre staff who provide statistics support in Higher Education (HE)
- **Liverpool John Moores University:** Leslie Fletcher - A collection of online practice questions to improve the numeracy capabilities and confidence of nursing students
- **London South Bank University:** Larry Krause - A series of help sheets with an accompanying bank of questions for Nursing Students
- **University of York:** Francis Duah - 30 Two-page Help Sheets for Economics and Finance Students

Each project will receive a grant of £2,000. It is a condition of the grant funding that all resource outputs are peer reviewed prior to being made available to the wider community via mathcentre.ac.uk and statstutor.ac.uk.

Noel-Ann Bradshaw – South East Hub co-ordinator

Noel-Ann has been teaching mathematics at the University of Greenwich since 2007. She started the first support group for Greenwich maths students as a mature student in 2005. This has since grown and, with the help of funding from HESTEM, has become the first *Maths Arcade*. This focuses on providing maths students with an opportunity to play strategy games to aid mathematical thinking as well as giving mathematics support.



Noel-Ann Bradshaw

Noel-Ann is a University Teaching Fellow and in this capacity is helping to support the mathematics development of various students in the Business School as well as contributing to other aspects of teaching and learning at Greenwich and in the wider HE community. She frequently gives talks at schools on 'Why do Maths?' to encourage more students to take the subject further – either for A-level or at university. She is currently a member of Council for both the Institute of Mathematics and its Applications and the British Society for the History of Mathematics and is a member of the Operational Research Society.

As a coordinator of the **sigma** hub in the South East she is keen to organise and facilitate events to help and support those working in maths support and would welcome ideas and suggestions.'

Maths support – Who needs it and why (and what that means for our centres) – 27 June 2014

sigma Midlands Hub Event

Ruth Fairclough, sigma Midlands Hub co-ordinator

The **sigma** Midlands Hub is holding an event, *Maths support – Who needs it and why* at The University of Wolverhampton, Walsall campus on Friday 27 June, starting at 10:30am.

Representatives from FE will be presenting to give a fuller picture of the skills undergraduate students may typically possess in mathematics and statistics. A case study of collaborative work done at Wolverhampton University will be presented as an example of good practice.



Ruth Fairclough

If you have liaised with academics based in the subjects whose students use maths support, we would like you to share your experiences and any impact this has had on your support centre. There will be ample opportunities for discussion of any good practice highlighted and issues that are common across support centres.

If you would like to attend this event, there is no charge and refreshments and lunch will be provided. Please let Ruth Fairclough (R.Fairclough@wlv.ac.uk) know if you are planning to come so that catering arrangements can be made.

sigma workshop on using puzzles and games in maths support – 26 June 2014

sigma South East Hub Event

Noel-Ann Bradshaw, sigma South East Hub Co-ordinator

The SE **sigma** Hub is organising a free workshop entitled 'Using maths puzzles and games in the teaching of mathematics' at Kings College, London on Thursday 26th June from 10:30-4pm (room TBA and directions to follow). Lunch and refreshments will be provided. Speakers will include:

- Sally Barton (Sir George Monoux) – 'Puzzles to engage students in problem classes'
- Noel-Ann Bradshaw (University of Greenwich and **sigma** SE Hub Coordinator) 'Promoting problem solving through the Maths Arcade'
- Danny Brown (Greenwich Free School) 'Using puzzles and games to motivate student engagement in maths'
- Claire Cornock (Sheffield Hallam University) 'How to teach Group Theory using a Rubik's Cube'



Various strategy games used in the Greenwich

- Peter Rowlett (Nottingham Trent) 'Puzzles and problem solving used with 1st year maths undergrads and the Big Bang'
- Allison Smale (Bucks New University) 'Using puzzles and games to help overcome numerophobia'

This workshop should be of interest to any involved in teaching maths at all levels, and particularly those involved in motivating students from other disciplines by showing them that maths can be fun! There will be a time of discussion and sharing ideas so if you have a particular game and/or puzzle that you use effectively in your teaching please do bring this along. Although this is organised by the **sigma** South East Hub it is open to any maths support practitioner.

Please email Noel-Ann Bradshaw (n.bradshaw@gre.ac.uk) if you would like to attend, giving details of any dietary requirements. (Twitter: #SigmaSE)

Graduate numeracy tests, 16 July 2014

sigma South West and South Wales Hub Event

Emma Cliffe, sigma South West and South Wales Hub co-ordinator

The **sigma** South West and South Wales Hub is holding an event on *Graduate Numeracy Tests*, at the University of Bath on Wednesday 16 July. The main focus of the meeting is to consider how mathematics support centres may assist students with improving their numeracy when their end goal is to improve performance on graduate numeracy tests.

Naureen Durrani of the University of Sussex and formerly of *Every Student Counts: Promoting Numeracy and Enhancing Employability*, a three year project led by the University of Central Lancashire, will open the day by exploring some of the challenges. Laura Lawrence, Careers Adviser at Bath will speak about how tests are used and how the Careers Service assists students and finally Matthew Jones of Nationwide Building Society will speak on assessing numerical proficiency for analytical roles in the financial services sector. In the latter part of the day there will be a structured discussion and sharing of practice around devising strategies for supporting numeracy led by Janice Richards, the MEI Programme Leader (Industry).



Emma Cliffe

For further information and to register for the event please see <http://www.bath.ac.uk/study/sigma-sw/events/numeracy.html>.

Ideas exchange, 19 June 2014

sigma North East and Yorkshire Hub Event

Vijay Teeluck, Leeds University

sigma North East and Yorkshire Hub is holding an event on Thursday 19th June at the University of Leeds from 10:30 to 15:00.

The day will run as an exchange of ideas and discussion on topics of current interest with the aim of strengthening links between the maths support centres and practitioners in the region.

The morning session will begin with a discussion

led by Vijay Teeluck on the proposed reforms to the A Levels and how this affects us in Maths



Vijay Teeluck

Support Centres. In addition, Ellen Marshall will provide a review and update to the **sigma** Statistics Advisory meeting: *Improving the support we give to students and each other* which was held on the 9 April at Birmingham City University. In the afternoon Rachel Homer will give a talk on how she provides Statistics and Mathematics support specifically to students in the Geography department, University of Leeds. We end the day with updates from each centre and exchanges of good practice. The programme may be accessed [here](#).

There is no charge for attending this event and refreshments and lunch will be provided.

Please let Vijay Teeluck (v.teeluck@leeds.ac.uk) know if you are planning to come so that catering and arrangements can be made.

Creating and maintaining a social media presence, 20 June 2014

sigma North West and North Wales Hub Event

Leslie Fletcher, sigma North West and North Wales Hub co-ordinator

A reminder that 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, starting at 10am.

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.



Leslie Fletcher

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, has put out a general call for contributions on the **sigma** JISCMail list (<http://www.jiscmail.ac.uk/sigma-network>) and would like to have offers of short talks on this theme as soon as possible.

There is no charge for attending this event and refreshments and lunch will be provided. Please let Leslie Fletcher (L.R.Fletcher@ljmu.ac.uk) know if you are planning to come so that catering &c. arrangements can be made.

Hands-on use and evaluation of Prezi and How can maths support work together with other support services?, 18 June 2014

sigma Eastern England Hub Event

David Bowers, sigma Eastern England Hub co-ordinator

The Eastern England Hub of **sigma** is holding a meeting on 18th June 2014 at University Campus Suffolk, Ipswich based around two themes of topical interest:

- Hands-on use and evaluation of Prezi, and
- How can maths support work together with other support services?

More details available [here](#).



David Bowers

This is a FREE event, supported by the Eastern England Hub of the **sigma** Network for cross-university

mathematics and statistics support. Lunch and refreshments are provided.

We may be able to cover travel costs of attendees from the Eastern Region.

Please send an email with your full workplace contact details to: d.bowers@ucs.ac.uk. Joining instructions will be sent in due course. Places are limited, to allow all delegates use of a PC, so early booking is recommended.

We look forward to meeting you and exploring opportunities for mathematics and statistics support.

Statistics advisory meeting – 9 April 2014

Alun Owen, Loughborough University

This workshop, which was jointly organised by the Midlands and North East & Yorkshire regional hubs, was fully subscribed with 25 delegates representing 16 different HE institutions in England and Wales. The event considered a number of issues relating to the provision of statistics support in HE, and included a number of focused sessions relating to “improving practice in the provision of statistics support”, “centralised statistics resources”, “supporting new statistics tutors” and “the use of Likert scales”. Resources developed for the day can be found at http://www.sigma-network.ac.uk/?attachment_id=1288.



Delegates attending the Statistics Advisory meeting at the university of Birmingham

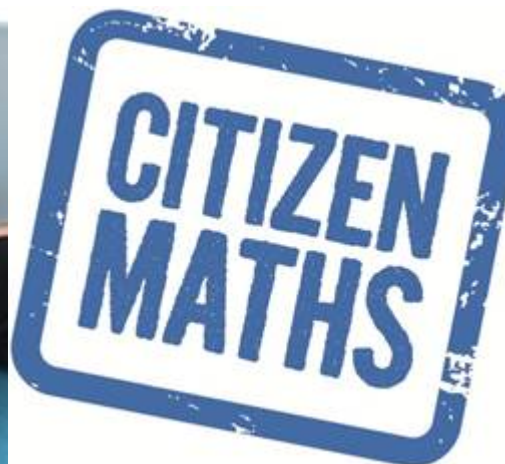
The first session included an activity based on a typical student scenario that raised a number of questions, such as “How can we help students to help themselves rather than doing the analysis for them?”, “How do we help students if it’s coursework?”, “What if it’s a final year project – can we still help them?”, “What should you do if you don’t know the answer?”, along with many more not always with a clear consensus!

The second session provided an opportunity for participants to suggest their favorite online resources, and included an overview of **stats**tutor (www.statstutor.ac.uk) and CAST (http://cast.massey.ac.nz/collection_public.html). The way new resources can be contributed to the **stats**tutor site via the **stats**tutor Community project (<http://www.statstutor.ac.uk/communities>) was also discussed.

The final session included a presentation by Alun Owen (Loughborough University) and Ellen Marshall (University of Sheffield) about their ideas for the development of a training pack, aimed at new or less experienced statistics support tutors and PhD students who provide statistics support. There was strong support for the idea and, funding permitting, they hope to take this idea further. This session also included a useful presentation by Laurence Moseley (University of South Wales), who discussed the use of Likert scales and considered issues such as “How many points should you include on your Likert scale?”.

Citizen Maths

Noel-Ann Bradshaw, University of Greenwich



Filming of hand calculations

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We are all aware that many students and other people are not as familiar and confident with some of the basic mathematics techniques that we think they should be. *Citizen Maths* is a new open online course - it remains to be seen if it will also warrant the term "massive" - that will be going live this summer, aimed at those who realise that they need to improve their mathematical capability. Development of the course is being funded by the Ufi Charitable Trust.

Those of us involved in maths support of non-mathematics students in HE might find some of the content useful for those learners we come in contact with. The first part of the course looks at the powerful idea of proportion and teaches this in the context of sharing, scaling, ratios, inverse proportions and making comparisons. The material is delivered by myself and Paula Philpott (SERC, N. Ireland) through tutor to camera videos, demonstrations using pen and paper (see picture) and screencasts of us demonstrating various activities using spreadsheets, Geogebra and the programming language Scratch.

The use of Scratch is perhaps one of the most unusual parts of the course. As well as teaching and supporting, we are aiming to challenge, intrigue and above all to motivate the learner to think. For example, using Scratch the learners are shown how to create a drawing and then make it bigger or smaller, they are also shown how to draw a pie chart with part of this activity left to the learner to investigate for themselves.

The curriculum has been put together by maths educators from the Institute of Education (Professors David Pratt and Richard Noss and Piers Saunders). For more details about Citizen maths go to <http://citizenmaths.com> where you can sign up for further announcements.

Induction Day for New Mathematics Support Centres – 28 March 2014

Michael Grove, sigma Associate Director

On the 28th March 2014, representatives from the four new sigma funded mathematics support centres at Bournemouth University, Halesowen College, King's College, London and the University of Leicester gathered at the University of Birmingham for a new centre induction day. Halesowen College is the first further education college to secure sigma support to establish a mathematics support centre for its higher education students.

The induction day was based around a successful 'briefing' format developed for new centres during the National HE STEM Programme. Members of the sigma team offered advice and guidance on 'setting up' a support centre, and provided participants from the four universities with opportunities to seek advice specific to them and their institutions.

Delegates were also able to see mathematics support being provided to undergraduate learners through a visit to the University of Birmingham's Mathematics Support Centre which itself was established in 2012 with the support of sigma.



Throughout the day a number of key areas were discussed that are vital to anyone establishing new mathematics support provision: identifying the most appropriate delivery model, useful resources and materials, providing statistics support, promoting your support centre and capturing participation data, and determining those with the appropriate skills and attributes to successfully aid learners in a mathematics support centre environment. Postgraduate students were identified as being excellent potential mathematics support tutors, and during the day, John Meyer (School of Mathematics, University of Birmingham) shared his experiences of working in mathematics support whilst being a postgraduate student; in particular John identified it was essential to involve tutors who have prior experiences of teaching mathematics in a small group environment for them to be able to tutor effectively. Several sigma resources are available to help those with new and existing centres in these areas including: [How to set up a mathematics and statistics support provision](#) and [Tutoring in a mathematics support centre - a guide for postgraduate students](#).

The challenges associated with sustaining mathematics support provision were noted, but the most recent sigma national survey, [Mathematics learning support in UK higher education the extent of provision in 2012](#), which explored the extent of mathematics support provision within UK higher education institutions, comments "Almost all institutions which were identified as offering support in 2004 have continued with their provision" and an increasing number of HEIs are explicitly referencing mathematics support within their Office for Fair Access (OFFA) Agreements. While there is increasing evidence that mathematics support is becoming sustainable, it remains vital that those running mathematics support centres continue to seek support from their institutional senior management teams, and continue to collect data and evidence that showcase their impact upon a wide range of learners.

Interactive Technologies for Maths and Statistics Support - 19 March 2014

David Bowers, sigma Eastern England Hub co-ordinator

As maths support tutors, we do not just spend our time in one-to-one support situations. We are increasingly invited into courses to deliver occasional “guest lectures” on mathematical or statistical topics to large groups of students. This event held at the Eastern England Hub gave a hands-on overview of a variety of interactive technologies that can help to engage students and hopefully make the lecture memorable and meaningful for them.



We started with audience response systems, also known as “clickers”, which enable the audience to vote on a range of options and the result of the vote to appear instantly. Delegates practised embedding interactive questions into PowerPoint presentations, and a discussion of the pedagogical considerations around the effective use of clickers in mathematics learning was led by our guest speaker Andy Ramsden, e-learning Manager at UCS.

We then considered the Poll Everywhere system, where text messages sent to a given number are projected on a screen. This can allow qualitative responses to be collected, which can be richer than simply responding to multiple choice questions. It also allows students to (anonymously) text in questions and comments either before, during or after a session, and these can be displayed collectively and discussed.

As an alternative to using text messages, response data can be submitted via GoogleForms using a range of online devices (laptops, tablets, smart phones). Delegates experimented with designing GoogleForms and collating the responses to a GoogleSheet, from where they can be exported to Excel or SPSS and analysed.

Finally, a “show and tell” session for mobile apps allowed delegates to demonstrate and share apps and websites that they have found useful for teaching and learning.

This event was attended by delegates from eight universities in the Eastern region, all of whom left with at least one new idea to try out with their next group of unsuspecting students!

Halesowen FE College SUMS Centre

Richard Jones, Halesowen College

Halesowen College has been given the opportunity to be the first tertiary/FE college in the UK to set up a dedicated Support Mathematics and Statistics centre (SUMS) for our ever increasing population of HE students, supported by the **sigma** Network.

Students are studying a range of HNCs, HNDs, Higher Apprenticeships and Foundation degrees at the College in collaboration with Newman College and Worcester University. With many courses increasingly having a larger content of statistical analysis there is a need to be able to react to this. Many of the colleges’ HE students have no mathematics qualifications beyond GCSE which they would have completed a long time ago and therefore this has been having an impact on the success of the students in certain modules of their course and this is where the college hopes the SUMS

centre will be a valuable resource.

The operational model will be based around 2 hours a day 'drop-ins' and 2 hours a week bookable specialist Statistics support which the college hopes will allow our students to improve their knowledge and skills in a more tailored environment. The dedicated centre will be resourced over the summer period and be available to the students from the beginning of September. The centre will be managed by the Mathematics Team in close liaison with Heads of Schools across the college so that we are able to deliver an effective and friendly service to all our students.



Halesowen Campus

The Maths department already have subscriptions to Integral and MyMaths as well as many software resources on our Moodle site. The college will add a dedicated website and Moodle pages for the centre. We intend that students have access to both computer and paper based resources.

Mathematics Centre – University of Leicester

Gareth Woods, University of Leicester

The University of Leicester is very pleased that we have received funding from the **sigma** Network to open up a mathematics support centre. The centre will be opened at the start of the 2014/15 academic year and will be providing help to all students and staff at the University.

The centre will be providing daily two-hour seminars on a variety of mathematic topics. This will give students the opportunity to brush up on concepts that they may not cover or have not fully understood in lectures. We will also run sessions on various software packages such as SQL, R, and LaTeX. In addition, we will offer a daily two-hour drop-in centre where students can ask any questions that

they require, but targeting students that need support with mathematics and basic statistics.



Gareth Woods

We also believe that there are lots of Widening Participation outreach opportunities for the centre. In collaboration with the Maths Hub in the city of Leicester and the Education Improvement Partnership, we will be offering Easter holiday revision sessions for both GCSE and A-Level students in 2015, targeting pupils on the A/A* boundary. There is also potential to run summer holiday motivation classes targeting pupils in year 10 to help them with the transition of year 10 to year 11 and we will be piloting this work this year.

Bournemouth University Statistical and Mathematical Support Centre (BU SMSC)

Hossein Hassani, Bournemouth University

Bournemouth University is grateful to the **sigma** fund for facilitating the setting up of the statistical and mathematical support centre which has for long been in demand. The BU SMSC team comprises of Dr. Hossein Hassani and Dr. Mansi Ghodsi (Heads of SMSC) and Emmanuel Silva. Initially, the BU SMSC will focus on providing stats and maths support for approximately 750 students representing the Business School.



Whilst the project is planned to kick off officially in September 2015, we have already organized many productive support sessions to support students before their final year end examinations.

Over the summer period we have organized several meetings with module co-ordinators to help prepare relevant materials and we have already obtained dedicated time and space for the SMSC to operate via timetabling. This will enable the support sessions to appear on all Business School undergraduate's timetables. Moreover, we have already obtained IT approval for setting up a dedicated website for the SMSC which will go live before the beginning of the new semester.

Initial feedback on the quality of the SMSC service has been highly positive with all ratings ranging between 4-5 on a scale 1 to 5 with the latter representing an 'excellent' quality of service.

Mathematics Support Centre at King's College London

Gavin Beattie, Library Services, King's College London

King's is proud to be one of the new Maths and Stats Support Centres funded through **sigma**.

King's entry standards are high, and our students are well-qualified, but many still struggle with the maths and stats they need for their courses. Many in non-mathematical disciplines only have maths to GCSE and those returning to education after a break may need a refresher. We have well established support for language skills (both English and modern foreign languages), but until recently support for numerical skills has only been offered in some



departments. A recent audit of academic skills provision flagged this as a gap in provision.

We will be running a Maths Support Centre, open for 15 hours each week and staffed by well-qualified postgraduates working under academic supervision. The Centre will be in the Maughan Library, one of the busiest spaces across all of our campuses, and managed within Library Services. Students will be able to make appointments and drop-in for one-to-one tutoring in an informal setting.

We're currently piloting our centre over the exam period, opening two afternoons each week. Feedback from this pilot will be crucial in our final planning for the centre being fully operational from September 2014. Final plans for setting up in September will take place over the summer (with much gratitude to HEFCE and **sigma** for funding this start-up phase).

Twitter @sigmahubs

Noel-Ann Bradshaw, University of Greenwich

If you are active on Twitter, you might have noticed that **sigma** now has its own Twitter account @sigmaHubs. This means it is now much easier to advertise **sigma** events and publicise what is happening in maths support in your area. You can also use Twitter to ask questions of the many maths educators out there.



If you are on Twitter just follow @sigmaHubs and include this name when you tweet about **sigma** events you are hosting. This will enable those of us with access to the **sigma** Twitter account to see your tweet and retweet it to get your event out to a wider audience.

If you are not on Twitter (I do recommend that you investigate it) then just email Janette and Moira and ask them to Tweet on your behalf – you just need to remember that the message can only be 140 characters in length so it is usually good to give a very brief message followed by a relevant url so readers can find more details.

When you are planning a meeting you might want to create a hashtag so that people at the meeting/conference etc can Tweet about the event and you can then find all the relevant tweets. I use #SigmaSE for all events run by the SE hub. During and after the CETL-MSOR conference in September, anyone on Twitter will be able to find out about the conference by searching for #CETLMSOR14 and reading the tweets of those who are there.

You might want to find out more about using social media in general by coming to the event on this on 20th June in Liverpool. More details are available elsewhere in this newsletter or [click here](#).

Ideas exchange and development – 26 March

*Emma Cliff, **sigma** South West and South Wales Hub co-ordinator*

On Wednesday 26th March, the first **sigma** SW&SW meeting of 2013/14 ran as an ideas exchange with the aim of re-establishing links between maths support practitioners in the region. Attendees representing Bath, Bristol, Bournemouth, Cardiff, Exeter, Swansea and UWE each provided a summary of their maths support



work. This overview uncovered similarities and differences between services and enabled each institution to add to a list of shared challenges, interests and areas for future development. Updates provided a summary of their maths support work. This overview uncovered similarities and differences between services and enabled each institution to add to a list of shared challenges, interests and areas for future were relayed from Plymouth, Portsmouth and South Wales who had sent apologies.

In the afternoon small groups focussed on specific areas for development namely statistics support, maths study skills support and support for students with weaker mathematical backgrounds including diagnostic testing. Some items of the extensive list from the morning were agreed to be areas of strong interest which should be developed over time. This included planning how to set up and maintain an active virtual SW&SW community to enable sharing of practice more regularly despite the distances between institutions. The discussion groups in the afternoon were successful in sharing practice and produced ideas that could be built on into the future. Attendees felt that the most helpful things were: *“extended informal discussions to share experience”*; *“hearing the overviews of different institutions”* and *“networking”*. The day was well received with comments including: *“really useful to understand common problems [...] found some solutions and had some good ideas”* and *“will definitely be attending again in the future”*.

Mindfulness, STEM students and self-determination

Karisa Krcmar and Tina Horsman, Loughborough University

A Mindfulness for Study programme, accompanied by specific study skills tuition, can help STEM students with SpLDs (dyslexia, dyspraxia, ADHD) towards self-understanding, emotional intelligence and developing appropriate strategies to counteract these difficulties.

Mindfulness is a way of training the brain to intentionally focus on one thing, in the present moment, to the exclusion of distractions. For example, focusing on the breath is a good exercise. Each breath is in the present moment – you’re not focusing on the breath you have just taken, or the one you will take – but on the breath NOW. Your mind will wander (a hundred times); you will learn to recognise that your mind has wandered; you then intentionally bring it back to focusing on your breath. Students with specific learning differences (SpLDs) like dyslexia, dyspraxia and ADHD often experience difficulties with tasks involving organisation, self-motivation and procrastination. This can result in a learned helplessness, lack of confidence and low self-esteem. Mindfulness can help foster confidence, self-determination and, importantly, develop the necessary skills to increase employability.

Our eight-step programme (developed from Zylowska, 2012) synthesised mindfulness and study skills. We explored mindfulness techniques alongside different cognitive styles to develop an understanding of personal and specific needs. STEM students initially struggled with understanding their patterns of thinking, but soon learned to take control of their study behaviour. They identified

what thoughts and actions were inhibiting them from their tasks, used mindfulness techniques to prepare themselves for study and avoided the panic that frequently set in when they experienced difficulties. In short, they perceived, as one student put it that she “no longer succumbed to procrastination.” A mechanical engineering student said: “I hadn’t ever thought about what a visual thinker I was. I tried to do things and think in the same way as I perceived others did. I now see how visual thinking is crucial, not only to me, but to engineering”. This student went on to use his visual strengths to aid his conceptual understanding as well as revision and exam techniques.

At the end of the eight sessions, students reported a decrease in stress and panic and increase in self-reflection and self-confidence. They felt they were better able to manage their time and their work and assign appropriate levels of commitment to different tasks, achieving good, or better, results with more control and less stress. This self-motivation, self-awareness and self-confidence, we would argue, can only translate into better employability skills.



Zylowska, L. 2012. *The Mindfulness Prescription for Adult ADHD*. London. Trumpeter

The authors are currently developing a *Mindfulness for Study* book and one-day CPD event to train others to administer a *Mindfulness for Study* course. For information contact: Karisa Krcmar and Tina Horsman at dyslexiaeducation@gmail.com

Conferences

[sigma CETL MSOR Conference](#)

8-9 September 2014, Cardiff University

Events

[sigma Hub event: Hands-on use and evaluation of Prezi and How can maths support work together with other support services?](#)

18 June 2014, University Campus Suffolk

Workshops will explore Prezi and how those involved in mathematics support can work together with other student support services.

[sigma Hub event: Ideas exchange](#)

19 June 2014, University of Leeds

Workshops will explore ways of strengthening links between the maths support centres and practitioners in the region.

[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.

[6th Annual Scottish mathematics support network meeting](#)

20 June 2014, University of Dundee

'Carrying the Remainder: Maths & Statistics Support for University Students' will bring together UK Higher Education institutions to explore and discuss effective maths and statistics support techniques for student who are not specialising in these subjects.

[sigma Hub event: Using puzzles and games in the teaching of mathematics](#)

26 June 2014, Kings College, London

Workshops will explore the use of puzzles and games in mathematics and statistics support.

[sigma Hub event: Maths support – Who needs it and why?](#)

27 June, University of Wolverhampton

Workshops will explore experiences in mathematics and statistics support and good practice.

[sigma Hub event : Graduate numeracy tests](#)

16 July, University of Bath

Workshops explore how to support students preparing for employers' numeracy tests

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 [mathcentre](#) websites.

Research publications

Badger M., Sangwin, C.J., Ventura-Medina E. and Thomas C.R. (2012) *A Guide to Puzzle-based Learning in STEM Subjects*, University of Birmingham,
<http://web.mat.bham.ac.uk/C.J.Sangwin/Publications/GuideToPuzzleBasedLearningInSTEM.pdf>

Cottee M., Relph A. and Robins, K. (2013) *Supporting students making the transition from school to*

university– A national and local view of the maths skills crisis in the UK.
<http://library.iated.org/view/COTTEE2013SUP>

M. Gallimore and J. Stewart, (2014) *Increasing the impact of mathematics support on aiding student transition in higher education.*, Teaching Mathematics Applications, 33 (1), doi:10.1093/teamat/hru008

E. Ní Fhloinn, O. Fitzmaurice, C. Mac an Bhaird & C. O'Sullivan. (2014) *Student perception of the impact of mathematics support in higher education*, *International Journal of Mathematical Education in Science and Technology*, DOI:10.1080/0020739X.2014.892161,
<http://www.tandfonline.com/doi/full/10.1080/0020739X.2014.892161#.U2tGZ14r8rc>

Peter Samuels and Maggie Gibson (2013) *Developing a statistical advisory service through effective partnerships*, HEA STEM, http://www-new1.heacademy.ac.uk/assets/Documents/disciplines/stem/conf-proceedings-2013/MSOR/full%20papers/msor_062.pdf

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 1 August 2014.

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

or contact enquiries@sigma-network.ac.uk

Twitter: @sigmahubs @cetlmsor2014

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