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Editor's Note

As we approach, what is for many of us, the busiest time of the year filled with exam preparation and marking, I invite you to take a moment out of a busy schedule to read the 2019 spring edition of the **sigma** Network newsletter.

In this edition, you will find a range of resources used and reviewed by our colleagues from the Institute of Technology Carlow and the University of Chester. In terms of updates on the network initiatives, the chair of the Employability SIG shares the new resources developed to support students' preparedness for taking employers' psychometric tests. You are invited to join the newly formed Impact and Evaluation SIG to share ideas and experiences relating to evaluating the quality and measuring the impact of mathematics and statistics support and enhancement provision in higher education. You will also be able to have a glimpse of the forerunner of this very newsletter in the form of David's article on the Maths Support Association Archive. Among the invitations to future events, I draw your attention to the call for abstracts for this year's CETL-MSOR conference to be held at the University of Dublin from the 5th to 6th of September 2019.

Thank you to all authors for their contributions to this edition. The deadline for contributions for the next edition (Autumn 2019) is **2nd August 2019**. 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. To submit an item, see <http://www.sigma-network.ac.uk/sigma-newsletters/>.

Finally, as usual, the views expressed do not necessarily constitute recommendations from the **sigma** Network Steering Group or any associated parties.

– Hansa Bissoondeal
(University of Essex)

Impact and Evaluation Special Interest Group

Allison Loddick

Chair | Impact and Evaluation Special Interest Group

Learning Development Tutor | Library and Learning Services, University of Northampton

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A new Special Interest Group is being formed with the first online meeting planned for summer 2019. It is a platform for like-minded colleagues to discuss, research and disseminate ideas and experiences relating to:

- a) evaluating the quality, and
- b) measuring the impact of mathematics and statistics support and enhancement provision in higher education.

If you would like to be part of the group and help develop our understanding and approaches to measuring impact, please contact Allison.Loddick@northampton.ac.uk.

The Chair's piece: Responding to the call

David Bowers

Chair | sigma Network

chair@sigma-network.ac.uk

You might have seen the cartoon (reproduced below) that has been doing the rounds on social media recently. Originally created out of despair by a student to illustrate their frustration with the response to their call for help, it has caused a wince of recognition (and wry smiles) among those of us who work in maths support centres.

I used this image the other day in a training course for new maths support tutors, in the part titled "Dos and Don'ts of Maths Support". Clearly this came firmly under the "Don'ts"! But it did generate some discussion, along the lines of how best to respond to students who have perhaps been less than diligent in their studies hitherto. The important thing is to remember that students rarely seek help just to annoy us – it can be a big step for them to cross the threshold into the maths support centre, and it is our role not just to "sort out their problem" but also to do what we can to address their wider study skills to point them toward a more successful future.



'meme' shared on Social Media

I have been told (by people of younger years) that internet cartoons like this are called "memes", and their beauty is that they can be edited and re-purposed to deal with different issues. So here is a suggestion for people running maths support centres. The first image is titled "Me asking my manager for extra resources", and the third image is "Manager telling me I have to cope with what I've got". I am sure we have all been there; which is why it is all the more important to accumulate evidence of the **impact** of our work, so that future requests for resourcing are taken seriously.

For this reason, the **sigma** Network will soon be establishing a Special Interest Group on "Evaluation and Impact", so that people working in mathematics and statistics support can share ideas and case studies of how best to demonstrate the value of our work. When the call goes out for people to contribute to this SIG, I hope you will want to be involved.

Maths Support Centres expand in the Czech Republic

David Bowers

Chair | sigma Network

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The idea of maths support is growing among universities in the Czech Republic, thanks in no small part to the inspiration provided by the **sigma** Network.

In early March 2019 I was invited to visit the country for a second time, to provide further training for maths support centre staff. My first visit was in December 2017, to Masaryk University in Brno, and this time I was the guest of the Technical University of Ostrava. Ostrava is the Czech Republic's third city (after Prague and Brno), situated in the far north-east of the country near the border with Poland.

Sixteen people from five universities attended over the three days, which included training for newly recruited maths support tutors (based on the established [sigma tutor training guide](#)), advice and sharing of experience for those about to set up a new maths support service, and discussion of strategy for those planning to expand their existing provision.

Currently three universities in the Czech Republic operate a maths support centre: Masaryk University in Brno, Tomas Bata University in Zlin, and the Technical University of Ostrava. You can find a [link to their web pages here](#). None of these centres is more than three years old, but they are all able to evidence growing student numbers and an increasing range of activities and involvement across the faculties. Two universities – Brno Technical University and VSTE in Ceske Budejovice – plan to establish a maths support service next year.

Everyone was keen to share ideas and learn from each other, and in particular to grill me on how things are done in the UK, and what lessons we have learned in three decades of mathematics and statistics support on this side of the channel. Discussions carried on until late into the night, lubricated by the legendary quality of the local Czech beer. A bid for EEA funding was drafted, to enable future collaborative activities to take place.

math Support Centre

Vás srdečně zve na tutoriál

Jakou metodou mám vypočítat tento integrál?

Jan Kotůlek, Kateřina Kozlová, Arnošt Židek

středa 6. 3. 2019 v 14:00, opakování čtvrtek 7. 3. 2019
a středa 13. 3. 2019, vždy v NK 201

$$\int \frac{x^2+1}{\sqrt{x}} dx = \int \left(\frac{x^2}{\sqrt{x}} + \frac{1}{\sqrt{x}} \right) dx = \int \left(x^{3/2} + x^{-1/2} \right) dx = \frac{2}{5} x^{5/2} + 2\sqrt{x} + C$$

Nevíš jakou metodu vybrat pro výpočet konkrétního integrálu? Kdy použít per partes? Kdy a jakou substituci zvolit?

Pokud sis odpověděl ano, přijď. Jako obvykle vše ukážeme na příkladech, které můžete potkat u zápočtů i zkoušek.

web: msc.vsb.cz  [Math Support Centre](#)

Poster advertising a calculus revision workshop in the Math Support Centre at the Technical University of Ostrava. Mathematics is an international language!

Quizlet: Using a mobile app to solve problems with study

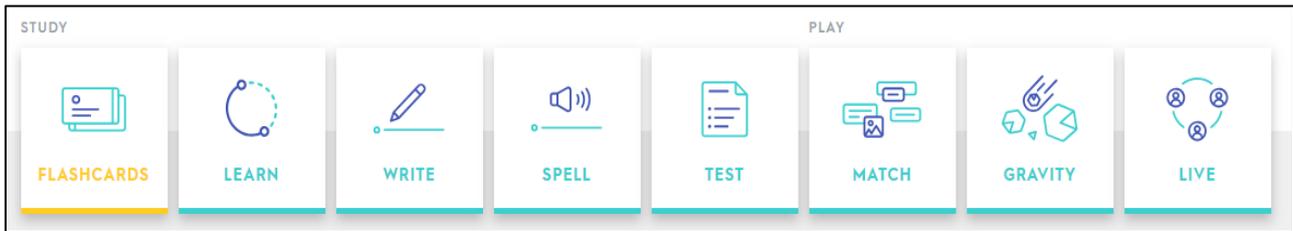
Richie Ryan

Lecturer - Carpentry & Joinery | Institute of Technology Carlow
richie.ryan@itcarlow.ie

Damien Raftery

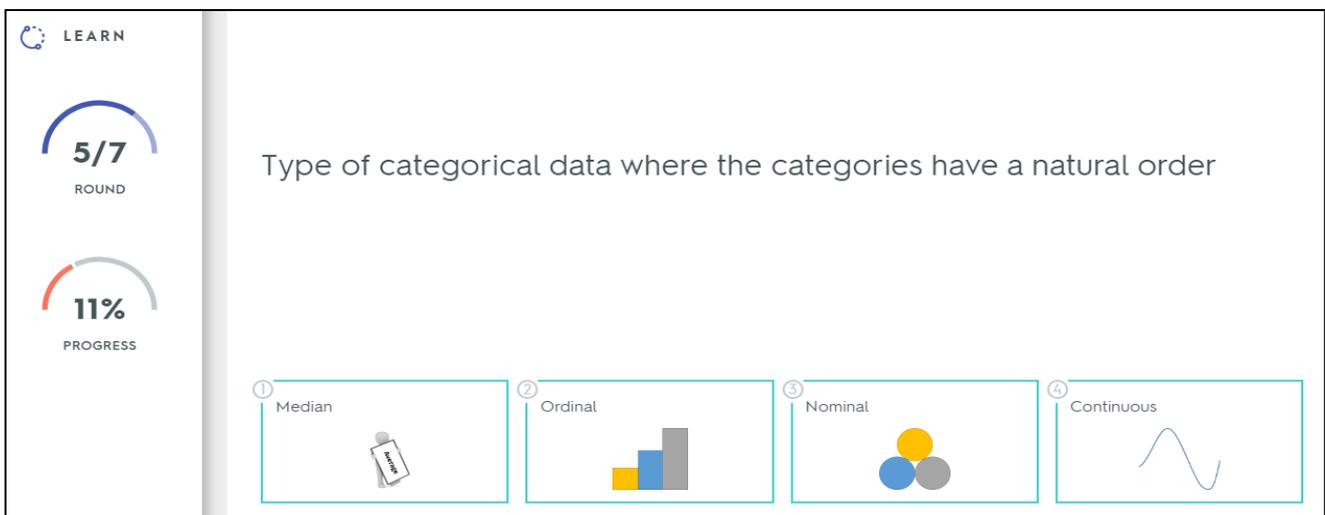
Lecturer - Mathematics & Statistics / eLearning Development | Institute of Technology Carlow
damien.raftery@itcarlow.ie

Quizlet is a web-enabled mobile learning application that uses a variety of different quiz modes to encourage student engagement in the classroom and promote self-directed learning activity outside of class time. It automatically creates quiz activities based on a deck of topic-related flashcards to promote learning while using effective pedagogical approaches associated with retrieval practice and spaced learning. It is very useful when learning foundational terminology and facts. The basic Quizlet application is free while annual subscription options remove ads, enable features which track and record learner progress, and allow user-created images to be included in the study-set.



Quizlet Dashboard showing the eight available modes of learning

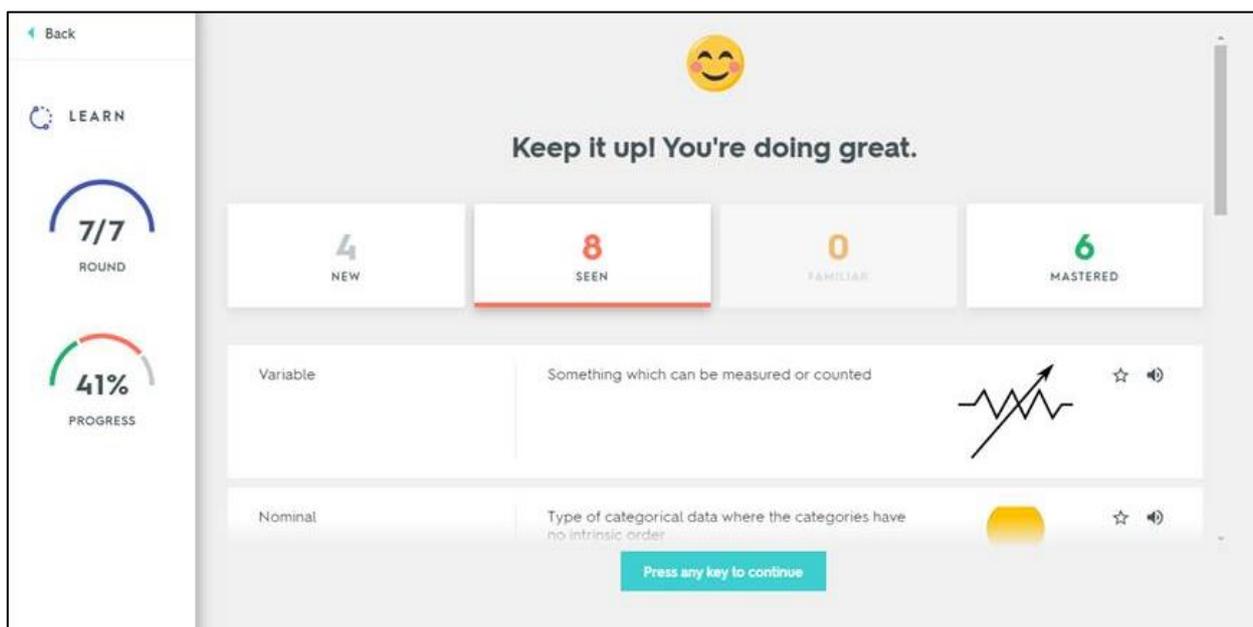
A study-set is a collection of terms and definitions that upon creation are automatically repurposed for use in any of the eight modes of learning. Study-sets are quick and easy to create or users can choose from the many shared by other Quizlet users.



Quizlet Learn mode illustrating one of many different question types

Sharing study-sets with class groups is a breeze and depending on the quiz mode selected by the student, Quizlet can tailor questions based on learner progress, provide audio narration, offer feedback and encourage students to take more responsibility for their own learning.

We have been using Quizlet to introduce fun and competitive learning activities into the classroom and to encourage student study activities outside of class time over the past two years. Quizlet makes it convenient and easy for students to access learning material and has contributed to higher levels of engagement and achievement. We would highly recommend Quizlet as part of your broader teaching and learning strategy, and particularly for students as a study aid outside of class time.



Quizlet learn mode: Tracking progress while offering encouragement and feedback

For more information, use the links to access a [short introduction to Quizlet](#), explore [how quiz modes support learning](#), check out this Quizlet to learn basic [statistics terminology](#) and watch [how to create your own study-set](#).

We would love you to share your experiences of using new resources or learning activities. Make sure you let us know if you run or attend an event that would be of interest to the mathematics and statistics support community.

See <http://www.sigma-network.ac.uk/sigma-newsletters/> for full details on how to submit an item.

Want to host a training event?

Get in touch! Drop an email to chair@sigma-network.ac.uk.

Get ready for job selection tests! Resources for students and staff

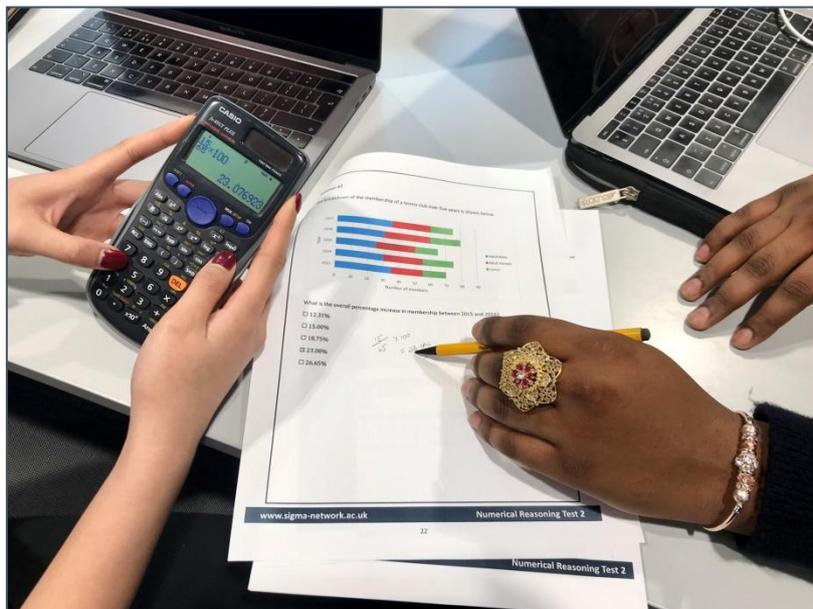
Dr Kinga Zaczek

Maths, Stats & Numeracy Programme Director | Royal Holloway, University of London

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The labour market in the UK is very competitive and all universities are increasingly focusing on the importance of producing employable graduates. Is one of your responsibilities to help students improve their employability skills? To support you in these efforts, the Employability Special Interest Group (SIG) has created a wealth of materials to be used by staff as well as students.

If you want to assist students in their test preparation, we have PPT slides that could be used in workshops. These include an overview of psychometric tests (numerical and non-verbal reasoning) as well as Numerical Professional Skills Tests for those going into teaching. To make the sessions more interactive, sample questions within presentations use TurningPoint polling software which is integrated with PowerPoint. These are just to get students started with thinking about tests they will most likely have to face.



Students working together on a practice test

The next step for the students would be to go away and to practise the tests. To this end, we have developed a bank of sample tests with full solutions, together with a comprehensive list of links to other websites offering practice tests. We have also included some links for self-study resources if students have to brush up on their numeracy skills.

These resources are available on the mathcentre website:

<http://www.mathcentre.ac.uk/courses/employability/graduate-numeracy/>.

Please contact Dr. Kinga Zaczek at Kinga.Zaczek@royalholloway.ac.uk with any feedback on these resources or if you would like to share/create similar materials.

Embedded Skills Adviser: Case Study

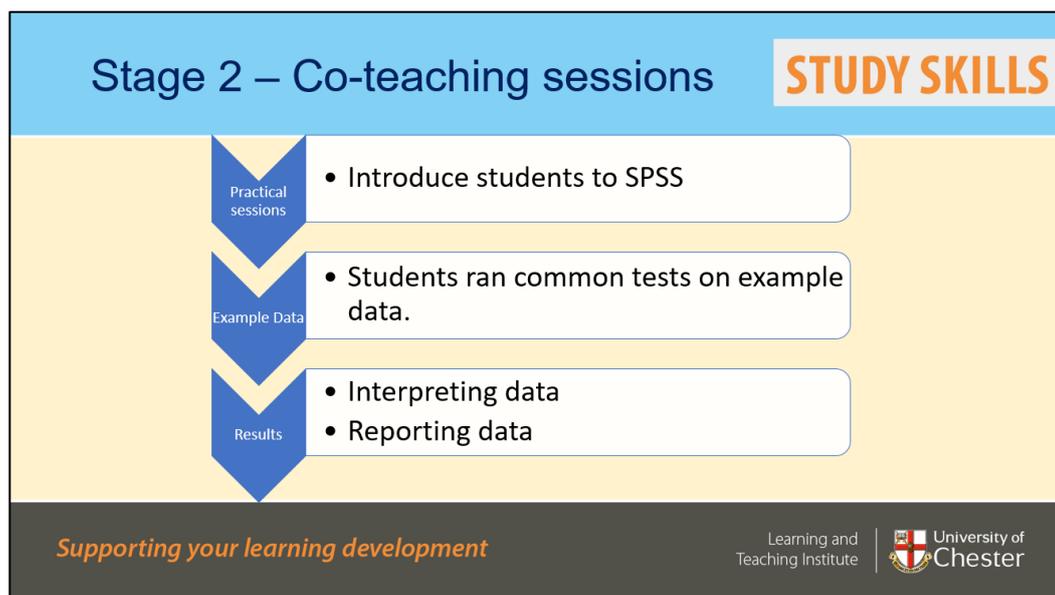
Nick Goddard

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Our aim as a Study Skills team is to embed our input directly into taught modules. This is usually accomplished through the production of resources or co-teaching specific sessions in a module. However, at one lecturer's request, I was fully embedded throughout one level 6 dissertation module. Common issues with this module in previous years had been that data had been collected that was not suitable to test students' hypotheses, or that students were unfamiliar with common statistical tests. These issues led to poor assessment outcomes and this case study was designed to attempt to avoid such issues.

We took a three stage approach. For the first stage, I sat in on initial supervision meetings, offering generic guidance. For example, suggesting what analyses could be completed given the type of data the student planned to collect. The intention was to give students the opportunity to collect data that was more suited to their hypotheses. The second stage was a series of targeted co-teaching sessions (see image). This allowed students to get used to using SPSS, including where to find key values in the output, as well as exposing them to some of the more common inferential tests.



Co-taught sessions delivered as part of stage 2.

For stage three, I made myself available for 1-2-1 appointments, so the students could come and see me with questions specific to their own work. These were made available to the students at a point in the module that they had data to analyse but would avoid panicked week-before-deadline enquiries.

Feedback was generally positive from students. The lecturer fed back that they had fewer data analysis queries which allowed them to spend more time focusing on other aspects of the student projects. They also welcomed my input at the initial stages of the project design and felt that an additional viewpoint was of benefit to students.

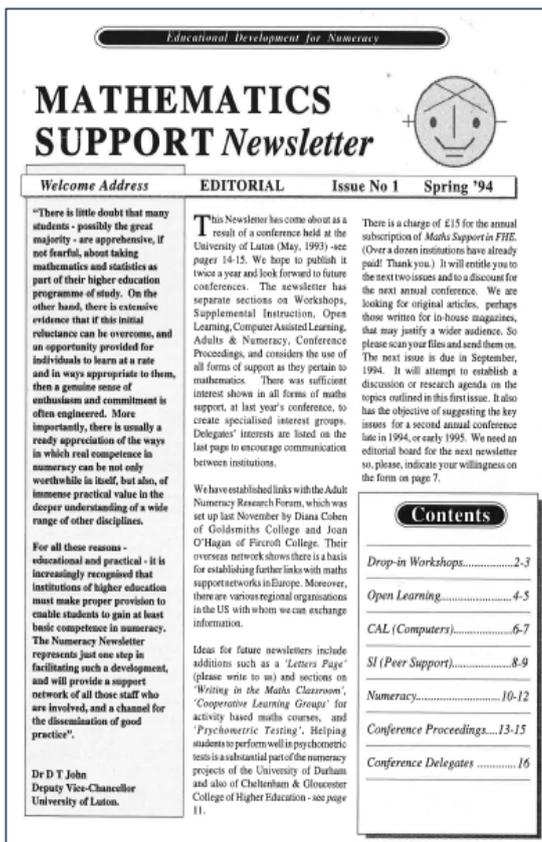
Maths Support Association Archive 1994 - 1999

David Bowers

Chair | sigma Network

chair@sigma-network.ac.uk

The 1990's was a defining moment in the development of mathematics support provision in further and higher education. There was increasing concern expressed about the mathematical preparedness of students entering colleges and universities, and reports such as '*The Changing Mathematical Background of Undergraduate Engineers*' (Sutherland and Pozzi, 1995) and '*Tackling the Mathematics Problem*' brought this issue to wider attention.



Title page of the first Maths Support Association Newsletter (Spring 1994)

student-centred maths learning. Then as now, a major concern was acquiring appropriate funding to establish such a resource.

If you want a further reason to browse these old MSA Newsletters, there is a picture of a very youthful Tony Croft in the Autumn 1997 edition!

We are indebted to Beveridge, Bhanot and others of 25 years ago for their foresight and commitment to the cause of maths support.

Reference: Sutherland, R. & Pozzi, S. (1995). The changing mathematical background of undergraduate engineers: A review of the issues. Report prepared for The Engineering Council.

Against this backdrop emerged a group of enthusiastic and committed staff from both the FE and HE sectors who were keen to establish mechanisms to support students with their mathematical skills. In 1993 a national conference was organised by Ian Beveridge and Rakesh Bhanot at the (then) University of Luton, which attracted 66 delegates from across FE and HE. Out of this conference emerged the Mathematics Support Association, which was instrumental in articulating the hopes, needs and experiences of maths support practitioners during the period 1994 to 1999.

In many respects, the Mathematics Support Association was a forerunner of the sigma Network today.

A regular Newsletter was produced, archive copies of which have now been scanned and made available on the [sigma Network website](http://sigma-network.ac.uk). Reading through the old MSA Newsletters, it is interesting to see how little has changed in the quintessential need for maths support, while at the same time so much has changed in the social and political context. In the 1990's, the talk was generally of "Maths Workshops" rather than "Maths Support Centres", reflecting the fact that in many cases it was Further Education colleges who led the way in setting up resource-based drop-in study locations for

Supporting Nurses with Drug Calculations – 22 May 2019, Middlesex University

Lois Rollings

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Supporting Nurses with Drug Calculations

Date: 22nd May 2019

Location: Middlesex University, Hendon

We will be hosting a free one-day event on supporting Nursing and Midwifery students with drug calculations on Wednesday May 22nd at Middlesex University in Hendon.

The focus will be on sharing experiences of the challenges this kind of support poses and of different approaches to overcoming them. This might include helping students with wider issues of arithmetic and/or calculator use. Attendees have the opportunity to present and discuss a 10 minute “case study” of their work. We will also hear from a senior Nursing lecturer and some Nursing students how drug calculations (and associated tests) fit into their overall degree programmes.

Draft Programme

10:00 Arrival: Registration and Refreshments

10:30 Introduction and Welcome

10:45 10-minute presentations and group discussion

12:00 Student nurses: Our experiences of drug calculations in theory and practice

12:30 Lunch and networking

13:30 Senior nursing lecturer: How drug calculations fit into the nursing programme, and the role of the NMC.

14:15 10-minute presentations and group discussion

15:15 Closing plenary

The event will take place in the Hendon Library building on The Burroughs. This is a 10-minute walk from Hendon Central (Northern Line) or a 20-minute walk from Hendon Station (Thameslink).

See <https://unihub.mdx.ac.uk/campus/hendon/getting-here> for more details. Places are limited. To register to attend, and to offer a 10-minute presentation, please complete this [form](#).

If you have any queries about this event then please email: numeracy@mdx.ac.uk.



Hendon Library building

Online maths support for remote learners – 3 July 2019, Staffordshire University

Angela Evans

Academic Skills Tutor | Staffordshire University

Angela.evans@staffs.ac.uk

Online maths support for remote learners

Date: 3rd July 2019

Location: Staffordshire University

We will be welcoming Sue Pawley and Tim Low from the Open University as our guest speakers who will cover how they teach mathematics online and how maths students are supported remotely outside formal teaching time. It is anticipated that such a comprehensive overview will give delegates plenty of ideas and inspiration to apply to their own situations.

On the theme of supporting remote learners, attendees are invited to present 10 minute '*show and tell*' talks about their experiences, which may be positive or negative. Time will be built into the programme for discussion and sharing of successful practice.

In the afternoon, after the second keynote speaker, hands-on workshops will offer attendees the opportunity to explore Blackboard Collaborate, Microsoft Teams and the use of graphic tablets as tools for online support. A more detailed programme of the day will be provided nearer the time.



Event venue: Staffordshire University Science Centre

Photo credit: www.staffs.ac.uk

The event will take place in the Staffordshire University Science Centre just around the corner from Stoke-on-Trent train station (a 2–3 minute walk). There will be refreshments upon arrival at 10:00am for a 10:30am start with a 4:00pm finish. Lunch is included and attendees will be contacted individually regarding parking requests, accessibility and dietary requirements.

Bookings can be made [Eventbrite](https://www.eventbrite.com). Please email Angela Evans at Angela.evans@staffs.ac.uk if you require any further information.

CETL-MSOR 2019: Call for abstracts

Eabhnat Ní Fhloinn

Director of Maths Learning Centre | Dublin City University

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CETL-MSOR 2019: Bringing together mathematics communities

Date: 5th – 6th September 2019

Location: Dublin City University, Ireland

This popular annual conference of those involved in mathematics, statistics and operations research teaching, learning and support in higher education is coming to Ireland for the first time in 2019!

We are pleased to announce our keynote speakers:

- Dr. Joe Kyle, University of Birmingham
- Prof. Duncan Lawson, Coventry University
- Prof. Alice Rogers OBE, King's College London

The call for abstracts is now open – deadline is 12th April.

The Conference Committee warmly welcomes submissions relating to the learning and teaching of mathematics and statistics within any discipline in higher education. For CETL-MSOR 2019, we are particularly keen to receive submissions that can demonstrate enhancements which are based on reflective and evidence-informed practice in relation to the following themes:

- Developing communities of learners in mathematics and statistics support within, and across, the disciplines.
- Teaching specialist mathematicians.
- Inclusive design for mathematics learning.
- Supporting students on the transition into and out of higher education.

We invite you to submit abstracts for oral presentations (20 minute session), workshops (60 minute session) and lightning talks (3 minute presentation). We are also interested in receiving student-led submissions.

Please download and complete the abstract submission form from the conference website:

<http://www.sigma-network.ac.uk/cetl-msor-conference-2019/>, save it as a PDF and upload to [EasyChair](#) by the deadline of **12th April 2019**.

Registration details will be available shortly on the conference website.

We will invite speakers to submit a full paper based on your presentation, which will be considered for publication in a special conference issue of MSOR Connections, after the conference.

Best wishes,

Eabhnat Ní Fhloinn, Dublin City University

Shazia Ahmed, University of Glasgow

Michael Grove, University of Birmingham

Ciaran Mac an Bhaird, Maynooth University

Rob Wilson, University of Cardiff

Training for New Maths Support Tutors – 24 September 2018, University of Leeds

Graham Weston

Maths Support Adviser | University of Leeds

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At the beginning of the academic year the **sigma** Network organized a training event for new maths support tutors, which was hosted by the Skills@Library Maths Support Service at the University of Leeds.

The training was delivered by David Bowers, Chair of the **sigma** Network. David started by giving an overview of maths support and leading the group in a discussion of what maths support is and why we need it. This led to some interesting debate, such as over the question “Is a maths support tutor a teacher?”

We then moved on to discussing some core dos and don’ts, as well as doing some role-play exercises to work through a few challenging situations “from the shop floor”. We rounded things off with a look at what maths support resources are available online and a reflection on the day’s events.

The workshop was attended by 9 participants, the majority of whom were completely new to maths support at higher education. The day provided an excellent introduction to all the key aspects of effective mathematics support, and it was riveting to see the participants engaging so enthusiastically with the various activities.

Despite the fact that I’ve been working a maths support adviser for three years now, I found I gleaned a lot of new and useful insight from the discussions and activities that I have been able to apply to my both my day-to-day tutoring and my longer-term strategic planning. I’d encourage other maths support services to consider hosting a similar event in the future, as it’s an excellent way to further engage with the **sigma** Network and to meet peers from across the region.



Attendees taking part in and observing a role-play exercise

Workshop on Scenario Based Statistics Support Training - 26 October 2018, Coventry University

Alun Owen

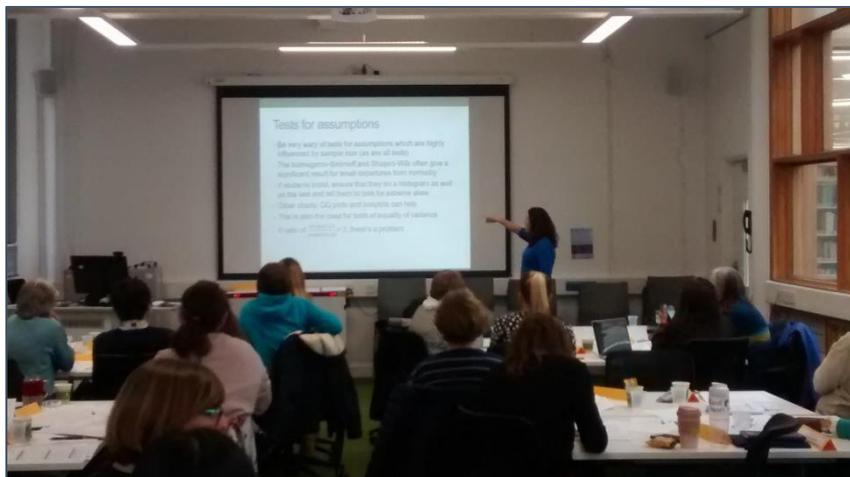
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Ellen Marshall

Senior Lecturer and Statistics Support Coordinator | Sheffield Hallam University
ellen.marshall@shu.ac.uk

On 26th October last year the **sigma** Network Special Interest Group (SIG) in Statistics Support organised a free statistics workshop which was hosted by the **sigma** Mathematics Support Centre at Coventry University. The workshop focused on using statistics training using a range of scenario-based learning resources developed by Alun Owen (Coventry University) and Ellen Marshall (Sheffield Hallam University). The sessions were led by both Alun and Ellen with support from Mark Hodds (Coventry University).

The morning session focused on managing a statistics support session, and explored the listening and questioning skills required of a statistics support tutor, including the issues a tutor should consider and what questions they should ask. A series of case-study videos were used to explore good practice with advising students on choosing the right test and some “dos” and “don’ts” were also highlighted via some entertaining short videos.



Ellen points out some important issues when helping students understand assumptions in statistical tests

After a very vibrant networking lunch, the afternoon turned to practicing the theory, via a series of paper-based role-play scenarios which required delegates to assume the role of the tutor or the student. Issues explored in this session included how do you explain statistical concepts quickly, handling difficult situations (e.g. conflict with what you think the student should do and what their project supervisor has suggested) and how to provide support rather than a consultancy service.

The workshop was extremely well-attended by around 25 participants representing 18 different institutions (see photograph) and a thoroughly enjoyable and valuable day of learning was had by all. The resources used during the workshop (or asked for by delegates at the workshop) are now available via a padlet wall at <https://padlet.com/acesem4/38mznmgo3ah>.

Four Regional Tutor Training Workshops – Autumn 2018

David Bowers
Chair | **sigma** Network
chair@sigma-network.ac.uk

Once again, members of the **sigma** Network kicked off the new academic year with a series of Tutor Training courses for new staff working in mathematics and statistics support centres.

Four events were held, which covered the regions of England and Wales:

- 21st September 2018 at the University of Greenwich
- 24th September 2018 at the University of Leeds
- 26th October 2018 at Cardiff University
- 7th November 2018 at the University of Essex.

A total of over 40 people attended these training events, from 10 different institutions. Most were postgraduate students who had recently been recruited to work in a maths support centre, but we also had several experienced lecturers who were now moving into a maths support service and wanted to explore the differences between maths support and traditional lecturing.

The training covered the key topics of:

- What is maths support, how does it differ from traditional teaching?
- Problem solving and meeting diverse student needs
- Dealing with challenging situations
- The special case of statistics support
- Resources for maths and statistics support
- Dos and don'ts of effective maths support

The format for these training courses followed the model devised by experienced trainers from the **sigma** Network and published in the **sigma** booklet *Tutoring in a Mathematics Support Centre* (<http://www.sigma-network.ac.uk/wp-content/uploads/2012/11/46836-Tutoring-in-MS-C-Web.pdf>).

Materials to accompany this training have been collated and are freely available on the **sigma** Network website (<http://www.sigma-network.ac.uk/resources/tutor-training-resources/>). Furthermore, an excellent article by Tony Croft and Michael Grove in a recent edition of *MSOR Connections* (<https://journals.gre.ac.uk/index.php/msor/article/view/305>) describes how these tutor training resources can be used in practice.

This year we once again demonstrated the effectiveness of collaborating across the Network to host and deliver new tutor training. Centres who knew they would be employing new maths support tutors and running training for them were willing to open up their training to people from nearby institutions to attend. This not only shares the load, but results in a larger number of attendees who can share a variety of experiences and backgrounds, making the training more vibrant.

If you anticipate recruiting new staff to your maths support provision next year, watch out for our call in the summer via the **sigma** Network Jiscmail list (<http://www.jiscmail.ac.uk/sigma-network>) where we invite centres to come together to share their training needs.

Impact and Evaluation Workshop – 15 March 2019, Coventry University

Dr Mark Hodds
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ab7634@coventry.ac.uk



Professor Duncan Lawson discussing the senior management perspective

On 15th March 2019 the **sigma** Network organized a workshop focusing on impact and evaluation of mathematics support, hosted by the **sigma** Mathematics Support Centre at Coventry University. The event was well attended with over 20 colleagues coming from 18 different institutions across the UK.

The day began with an excellent insight into the senior management perspective of maths support from former PVC of Newman University, Professor Duncan Lawson. He explained that by using the right form of evaluation of our provisions to show impact, senior management are often willing to provide support and funding.

We then reviewed current and former evaluation questionnaires from various maths support centres to determine what makes a good evaluation questionnaire. This was followed by the introduction of our new **sigma** Special Interest Group (SIG) in Impact and Evaluation. If you are interested in getting involved with this new SIG then please contact the SIG chair [Alison Loddick](#).

After lunch there was an interesting talk from Emma Cliffe (University of Bath) and Rob Wilson (Cardiff University) on their work together evaluating the MASH provision at Bath using a “critical friend”. This provided a different perspective on evaluating impact of a maths support provision using an expert from a different centre, and gave an update on their work since presenting at the 2018 CETL-MSOR conference in Glasgow.

The day concluded with colleagues sharing their impact and evaluation methods. This was a useful exercise as it gave colleagues new and different ideas on how to best evaluate their provisions.

An enjoyable and useful day was had by all and we are sure that with the new **sigma** SIG being introduced, there will be similar workshops run in the future.



Discussions on impact and evaluation questionnaires