

## WORKSHOP REPORT

# The new normal: What does maths and stats support and teaching look like post pandemic?

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## Abstract

The workshop “The new normal: What does maths and stats support and teaching look like post pandemic?” took place on the 1<sup>st</sup> of December 2022 and discussed the changes to mathematics and statistics support since the lifting of restrictions after the pandemic. The event consisted of five short talks where presenters explored the changes that had occurred to mathematics and statistics support at their institutions and concluded with a discussion on how to effectively combine online and face-to-face support and how to increase engagement in all forms of support. This report summarises the talks and discussion, concluding with some thoughts on the changes still required and how we can support each other.

**Keywords:** maths and stats support, online student support, **sigma** Network, post COVID-19 pandemic.

## 1. Overview

A workshop to consider the new normal in mathematics and statistics support (MSS) was held in December 2022. The aim of the workshop was to consider the changes in support from pre-pandemic methods and how well students were engaging with these new approaches. The workshop was a **sigma** Network (**sigma** Network, 2023) event hosted by The Open University. It took place online and was attended by 37 participants from 26 different higher education establishments in four different countries.

Prior to the COVID-19 pandemic, national surveys of MSS indicated that whilst there was widespread provision in the UK (Grove et al, 2019), and Ireland (Cronin et al., 2016), most of this support was face-to-face, with only limited on-line support being provided (Mac an Bhaird et al., 2021). The introduction of pandemic lockdown measures in March 2020, led to a rapid change in the provision of support (Hodds, 2020; Johns, 2021) with universities restricting campus access for students and staff so that MSS, along with most other teaching, had to move almost completely online. Consequently, as Hodds (2020) reports, most institutions saw a drastic reduction in student numbers participating in MSS when compared to pre-pandemic levels. As the restrictions were relaxed, Gilbert *et al.* (2021) reported that, of 12 practitioners from around the world interviewed in January 2021, most indicated that when in-person support was permitted, they would continue with some online support but as a supplementary offering. However, as reported in O'Sullivan & Pfeiffer (2023), there remain challenges in getting students to engage with MSS since the pandemic.

The workshop started with Holly Gilbert discussing the findings she had gathered over the period May 2020 to June 2021 on MSS in the “new normal”. It then followed with practitioners from four different institutions discussing how they were now offering MSS and finished with a discussion on how to effectively combine online and in-person support and how to increase engagement in all forms of support. The workshop recordings, and other resources, can be found on the **sigma** Network website (**sigma** Network, 2023b).

## 2. MSS in the “new normal”: The practitioner and student perspective

The workshop was opened by Holly Gilbert who is a third-year PhD student at Coventry University researching MSS in the “new normal” under the supervision of Professor Duncan Lawson and Dr Mark Hodds. She presented on the three areas of her research: the practitioner perspective, the student perspective, and observations of pedagogy. She then concluded by giving some recommendations on good practice for MSS provision in our “new normal”.

The practitioner perspective examined the types of MSS institutions offered prior to and during the pandemic and their current opinion of online MSS and how that has changed through the pandemic. This took the form of a longitudinal study, where she explored the results from:

- a questionnaire conducted by Hodds (2020), in particular the final open-ended question, “should we be changing our approach or replicating what we did face-to-face?”;
- data from 12 interviews undertaken in early 2021 (Gilbert et al 2021);
- and the results from a comparative survey between practitioners in Germany, Great Britain and Ireland which was completed in June 2021 (Gilbert et al 2023).

The main theme that arose from the 2020 study is that practitioners were unsure whether they should be replicating online what they did face-to-face or adopting new approaches. By the interviews in early 2021, all interviewees were seeing benefits from the flexibility of online MSS such as the ability to be more accessible to students that are away from campus but were noticing reduced interaction and the inability to see unspoken cues. In the June 2021 survey, most practitioners were still finding it difficult to determine how well students were engaging, however there were some that were finding it easier. The overall message from practitioners across the three studies was that returning to face-to-face MSS was positively anticipated but online methods should be used as a compliment.

The student perspective focused on the question “what are the current barriers to students’ engagement and how can we reduce them?”. She asked both users and non-users of MSS and found the two main reasons for non-use were that students were unaware MSS existed and that they were embarrassed to use MSS.

Gilbert then outlined her current research on observations in pedagogy, where she is comparing the behaviour of MSS tutors in online and face-to-face sessions with reference to a protocol she has designed and investigating whether her observations match the impressions of the participants involved.

Finally, Gilbert concluded by offering several recommendations to MSS providers, with the key advice being providers needed to advertise extensively, explaining not only what is on offer and where, but also the advantages of MSS, what students should expect and regular reassurance that MSS is for everyone. They also need to increase their advertising reach by utilising lecturers and making adverts more personal, based on for example subject groups, to highlight that MSS is not just for mathematics students.

## 3. Current MSS provision in four UK Universities

The workshop continued with four presenters from different institutions discussing the MSS provisions at their university, what their experiences are post pandemic, the challenges they are facing and how they are addressing them.

Lesley Davis, from the University of Leicester, spoke about how their support had changed over the last few years. Before the pandemic, the MSS team had access to a suitable permanent room, with

tables and chairs, where they were able to offer a dedicated drop-in support clinic every Thursday and a mix of drop-in support and booked appointments for the rest of the week. Post pandemic, they have been moved to a different room, which whilst more visible, is only suitable for booked appointments. The demand for booked sessions increased significantly after the end of the pandemic, but staff were aware they have a much larger capacity if they run drop-in sessions, as the time taken for the support is generally less than the booked session. To address this, they attempted to reintroduce their drop-in service on a Monday and Thursday. The sessions were promoted widely and directed at the same bodies of students that made good use of the drop-ins pre-pandemic. However, attendance at these has been very low, which could be due several factors including the sessions being in different rooms on a Monday and Thursday, and a perception amongst students that the drop-ins were only to be used if a booked appointment was not available. Therefore, from 2023, the centre will only be offering booked sessions, and they will be looking at how improvements can be made by changing the booking methods and offering a variety of appointment lengths, with the idea that they will be able to offer short appointments quickly, but a longer appointment will need to be booked in advance.

Inna Namestnikova discussed the current MSS provision at Brunel University where support had remained completely online during the last two academic years, only returning to blended provision in October 2022. Prior to the pandemic, a blended structure for MSS had been introduced in 2016/17, however the online sessions had very low attendance, with most students preferring to see support staff in person. During the pandemic, when only online support was available, the number of students attending these sessions increased to levels similar to pre-pandemic uptake of face-to face support. However, when the option of face-to-face support was reintroduced in October 2022 students continued to prefer to access online support. Moreover, the way in which students want to be supported appears to have also changed. There is a reduction in students attending central workshops, such as “Back to Maths”, which aims to improve their overall ability in mathematics, with students instead preferring individual tailored support. Looking towards provision for the future, MSS will need to include further support for their increasing post graduate population, trying to establish the best methods to support mathematics software packages and exploring the suitability of different conferencing facilities to support particular teaching activities. Inna’s final comment on the change to MSS, is that for Brunel students online support appears to work best.

Rob Wilson, from Cardiff University, focussed his presentation on the ways they were revitalising mathematics learning communities. This was framed by a discussion of the evidence around the potential impact of learning communities and how these support retention, motivation, well-being, engagement and other aspects of the broader student experience. Prior to the pandemic, by way of a student partnership project, Cardiff University had already begun looking at learning communities to help increase engagement. However, the pandemic had given them the opportunity to go back and consider what they value, what they are trying to encourage and how they go about it. The two key findings that arose from the student partnership project were that students can feel isolated from each other and from their department and faculty, and that communications could give a sense of hierarchy to students which can be seen as a barrier to belonging. From this, several changes, both formal and informal, had been made, and whilst they were trying to develop community, they were aware that there are lots of different sub-communities within the student body. Staff and students have been given responsibility and time to focus on community and there is now a student engagement officer and a student voice coordinator. They have completely changed the emphasis of their induction sessions encouraging students to speak to each other and find out who their peers are.

Alongside this they had also recently moved to a new building which provides both lecture theatres and shared social spaces where students can work and meet in an informal setting, creating an environment that has a “buzz” around it. MSS has an informal space in the new building but it does

not have a dedicated room. Consequently, since the pandemic, MSS has changed its physical location, the type of study space it uses and the times it operates. They are now trying to re-establish their presence and have seen an upward trend in drop-in numbers. Other changes since the pandemic include the introduction of a flipped classroom approach for a large core first year module which helps staff to see how students are coping, allowing them to react in real time to any problems. Informal activities such as an away day, a weekly board games hour, a coding club, pizza and movie nights have also been established, giving choice to students about what they get involved in and trying to integrate the Maths Society into the school further. Rob's initial reflections on these changes were:

- not to ignore small potentially positive changes that could be easily made. For instance, changing the way we address students via email to be more inclusive and less hierarchical (e.g. changing, "Dear students" to "Dear fellow mathematicians"),
- to keep in mind diversity, choice and ownership in changes made. Different students will engage at different times with different things for different reasons, so it is important to consider different options and choices within those options. It is also important to recognise that staff and students are part of the community and so it is important to get students involved in the planning and organising of activities.
- Staff engagement with the community requires just as much emphasis as student engagement.

Alun Owen discussed the past, present and future of the **sigma** Maths and Stats Support Centre at Coventry University. This is a large MSS centre, which offers support both face-to-face and online. Pre-pandemic, centre visits were in their tens of thousands per year, but during the pandemic period these numbers reduced significantly when all support was moved online. They observed that the abrupt changes brought about by the pandemic had led to increased levels of general anxiety which contributed to students having additional support needs, struggling with understanding content, and also potentially affecting their ability to access support. Students have also been observed to work in different ways, creating more online informal groups and working together online. More recently they have seen a significant return to in-person visits to the centre as students are seeing the benefit of face-to-face support. In 2021/22 all lectures at Coventry were hybrid, but students were only offered the option of online if required. Consequently, the number of visits to the centre increased and it continues to offer mostly face-to-face and some limited online drop-in sessions, which can be challenging for staffing as they cannot be run in parallel.

Since the pandemic and following on from Gilbert's research (Gilbert et al, 2021; 2023), Coventry University have tried to make their MSS centre more inclusive by, for example, placing inspirational quotes in the centre and changing advertising to make it clear the centre is not just for mathematicians. They have also tried to enhance the centre by making the lighting softer and are introducing sound reduction to help neurodiverse students. They seek regular, simple, immediate feedback from students to ensure they are happy with their visit. They have written a code of practice for centre staff, which is displayed to students so they know what to expect. This includes providing a friendly welcome, adapting their approaches where required, being honest about what centre staff can and cannot do. They are also trying to tackle plagiarism, by indicating that whilst they cannot directly help a student to answer coursework questions, they can help with course content that is relevant to coursework assignments. As well as continuing to run diagnostic tests for new students on a number of courses, they have also started several additional proactive measures to support students including running: refresher workshops (similar to Brunel's back to maths), consolidation workshops, maths anxiety workshops, and staff networks to connect with staff who may be working in isolation to support students with maths or statistics. There are also reactive measures that have been put in place, such as adapting timetables to run both online and face-to-face support sessions,

offering appointments of differing lengths in both modes of delivery, and making resources more accessible. To increase inclusivity, they also have academic staff from different subject teaching teams, such as nursing or engineering, contributing some hours in the centre so that their students can see it is not only for mathematics students.

Owen then discussed the changing situation of drop-in statistics consultations. Prior to the pandemic, the demand for statistics consultations was predictable with a clear peak every March corresponding to undergraduate project deadlines. However, in 2020/21 a second peak in demand occurred in June, due to students deferring their projects (as was allowed over pandemic). In 2021/22, demand had recovered to pre-pandemic levels with mainly face-to-face support but now with a far larger project peak in March and a second deferred project peak in the summer. This increased peak demand has been covered through an increase in staff numbers. So far, in 2022/23, statistics support demand has been even higher!

Looking to the future, the centre's students are coming from an increasingly wider range of subject areas, with many more courses, such as the biosciences for example, becoming much more data driven. They currently have students with increased general anxiety as well as mathematics/statistics anxiety and are unsure whether this will reduce once the effects of the pandemic lessen. There is a greater focus on MSS to contribute to access and participation plans, to facilitate support for those with additional learning needs and neurodiversity differences, with more accountability for the services provided and resources needing to be accessible. The support required is also changing with mathematics becoming more reliant on programming languages. Skills in data handling and coding are becoming more important with an increase in demand for new data science courses, computational social sciences and combined studies of data science and healthcare.

#### **4. Discussion on effectively combining online and face-to-face support and how to increase engagement in MSS**

After a short break we continued with a discussion on how to effectively combine online and face-to-face support and how to increase engagement in all forms of support. A couple of questions about the online diagnostic tests used at Coventry highlighted that whilst mathematics support was now mainly face-to-face there, which was seen as most effective, statistics support could sometimes be more suitably delivered online, where screens could be shared and online statistical packages supported more efficiently. This demonstrated the need for both online and face-to-face support to continue.

Further discussions on the development of a learning community at Cardiff displayed how many institutions were returning to concentrate on the face-to-face aspects however it has been noted that many students are not returning to face-to-face lectures and are instead relying on using uploaded materials and recordings to study courses. This in turn is affecting the number of students that are seeking face-to-face support and so support centres will need to adapt their provision to facilitate the ways students are learning and appreciate that students may be looking for alternative resources to supplement their learning more than they have done in the past.

The discussion then moved on to talk about the differences between formal and informal environments for MSS and what the benefits and disadvantages are of these two types of locations. With a formal physical space for MSS it is easy for staff to see students outside that may be reluctant to come in and who can then be gently encouraged. In contrast, when locating MSS within informal social areas, it is difficult for staff to tell if students need help or are just using the space. In a small formal space it maybe more obvious that a student is getting help, which could lead to anxiety or create a stigma. However, in a larger or informal social space, it can be less obvious that students are receiving help from staff as students are studying there independently which can make access

easier. Having a large flexible space available for MSS on a regular basis may encourage engagement from students but with space at a premium in most universities this is not always possible.

Looking at ways to increase engagement in support, a post pandemic initiative at the University of Bedfordshire was discussed where support staff coordinated with lecturers and visited as many lectures as possible, particularly those where there are known support requirements, to introduce themselves and remind students about the support available. This had resulted in increased attendance at the MSS centre. This has the added advantage of students seeing the faces of the support staff so they become more familiar, as well as showing that the support they offer is endorsed by the lecturer.

## 5. Conclusions

The use of MSS services changed dramatically during the pandemic and there remain questions about what best practice will look like in future. The way students engage with support has changed and the opportunities and lessons learnt have offered some improvements that now need to be incorporated into our more traditional methods. For some institutions there has been a change in student behaviour, and they are now more likely to book an online support session than turn up at a drop-in face-to-face session. At other universities, the demand for face-to-face support has returned alongside a provision of online support. How we adapt to the new style of support is still emerging and the discussions held in workshops like these are invaluable to help support each other and share practice.

## 6. Acknowledgements

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