

RESOURCE REVIEW

The sigma Accessibility Special Interest Group: Resources Update

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Abstract

This article contains a short update on the work of the sigma Accessibility Special Interest Group. We announce the release of resources to assist mathematics tutors and coordinators with the support of mature students and those with dyslexia, dyscalculia and dyspraxia. We provide a brief background to the development of these resources and describe their pilot in two institutions, one in England and the other in Ireland. We close with a description of the next stages of work for the special interest group and a call for additional people to get involved.

Keywords: Accessibility, dyslexia, dyscalculia, dyspraxia, mature students, resources, mathematics support.

1. Introduction and Background

The sigma Network for Excellence in Mathematics and Statistics Support has four special interest groups (SIGs) which relate to '*...a number of over-arching themes...that are of strategic interest to the mathematics and statistics support community in higher education.*' (<https://www.sigma-network.ac.uk/sigs/>). In 2016, the Accessibility SIG was established due, in part, to the increasing numbers of students with disabilities within higher education (HE) (Equality Challenge Unit, 2017) and the fact that the subject area of mathematics and statistics has one of the highest proportions of students with a disability (AHEAD, 2018).

The SIG was led by Emma Cliffe (University of Bath) and Clare Trott (Loughborough University), both of whom had been heavily involved in the development and provision of support for students with disabilities. See Cliffe et al. (2022) for a comprehensive overview of the work in this area prior to the establishment of the SIG. Initially, members of the SIG conducted a survey of mathematics learning support (MLS) practitioners and service mathematics lecturers across Ireland and the UK to determine the main student accessibility barriers that they encountered. For a full description of the findings and an analysis of the results, see Cliffe et al. (2020). Three recommendations arose from this research: the development of resources to assist MLS coordinators and tutors with their support of students with accessibility issues; increased focus on the training of MLS staff in relation to accessibility issues; and improved communication between MLS and corresponding accessibility offices and staff within and across institutions.

The focus of the SIG since then has been on the development of resources for each accessibility issue which would advise MLS coordinators on appropriate provision and offer practical suggestions to tutors on how best to support the students. Two workshops were organised in 2018 and 2019 to start work on the development of the resources. It was decided that the resources should be relatively brief, with a clear and straightforward layout, and with minimal specialist terminology. The tutor resources, designed to be used with students during MLS sessions, would start with a standalone introduction, a brief definition, and then lists of impacts on mathematics with corresponding strategies to help. At the end of the resource, there would be links to further sources of free practical information. The coordinator/manager resources would start with an expanded definition, advice on how to work with other services and recommended reading. The main focus would be on recommendations for MLS provision, e.g. appropriate equipment and software, physical and online environments, additional/alternative provision and tutor training.

Tutor and coordinator resources were completed for dyslexia and, in October 2019, a trial of these resources commenced at Maynooth University (MU). The availability of the resources was advertised via the Disability Office, through the Mathematics Support Centre (MSC), where tutors received training on how to utilise the resource. Each tutor was provided with a pack which contained the necessary materials to implement the strategies outlined during our in-person drop-in sessions. In this trial, the onus was on the student to request the use of the resources, as MSC tutors are not aware of any student's disability, unless they voluntarily disclose this information. While the number of students who engaged was relatively low, their feedback on the use of the resources was broadly positive, and full details are available in Heraty *et al.* (2021).

Due to the time demands required for the implementation of separate accessibility legislation in the UK, the completion of further accessibility resources was paused until the end of 2020. In 2021, resources for dyspraxia, dyscalculia, and mature students were finalised and two pilots commenced at the University of Bath (UB) and MU in the second semester of the 2021-22 academic year. These pilots also included the dyslexia resources. In the following two sections, we briefly outline the details of these ongoing two pilots.

2. The Pilot at UB

At the UB, mathematics support is provided in the Mathematics Resource Centre (MRC) and separated into general provision for any UB staff or student and also Mathematics Department specific provision. Peer Tutors (PTs) are student staff from the Mathematics Department who work with first-year mathematics students. Whilst some one-to-one provision is targeted at students referred from Disability Services, the first-year mathematics support is drop-in without appointment and PTs are not made aware of any specific diagnosed learning needs. The PTs run three open access drop-in sessions per week.

The trial focused on upskilling PTs, offering these inexperienced tutors initial guidance on dealing with student accessibility requirements. The twelve PTs are led by three Senior Peer Tutors (SPTs).

The resources were implemented as follows:

- 1) The manager of the MRC read the manager resources and provided the equipment from the recommended equipment list.
- 2) The SPTs were given copies of the four different resources for tutors and asked to run a one hour facilitated discussion with the PTs, in which they could share their thoughts on the ideas presented in the resources. The resources remained readily available to the PTs after the session.
- 3) Additionally, the PTs were surveyed before the session and two months later, to see if they had felt any impact from the training on their confidence and understanding of the different

accessibility needs. While data analysis is ongoing, and results will be reported on in full in a separate publication, initial findings are very positive.

This suggests that the resources themselves are pitched at the right level. However, it should be noted that almost all tutors indicated that they had no opportunity to use the resources. This presents us with the open question 'How can we improve the implementation of these resources?'

3. The Pilot at MU

At MU, MAP (Maynooth Access Programme) student is the generic term used for students registered with the Access, Disability and Mature Student offices. The second author is the MAP Academic Advisor for the Department of Mathematics and Statistics, which means that he acts as an academic point of contact for MAP staff and MAP students with regards to students' specific learning needs. A referral process is in place, which means that the Academic Advisor can meet with students and direct them to MLS as appropriate. For further details, see Mac an Bhaird et al. (2022). The MLS available currently includes one-to-one online sessions for MAP students, if they are required, in addition to the other MSC services.

The pilot took place during the 2021-22 academic year however, unlike the previous dyslexia trial, the dyscalculia, dyspraxia, and mature student resources were not available for use at the beginning of the first semester. Furthermore, in semester 1 of 2021-22, when the majority of lectures for first- and second-year service mathematics students remained online, there was very low engagement from these students with the in-person MSC drop-in. As a result, we decided not to pilot the resources through drop-in but rather to integrate them as part of the referral and one-to-one appointment processes. Ethical approval was received for the collection of student feedback on the use of the resources. Student awareness of the resources was promoted through the MAP Office. Any students studying mathematics or statistics who presented to MAP, and who fell under any of the categories which the resources covered, were made aware of the pilot of the resources and asked if they were interested in using them. Students who were already availing of the MAP one-to-one tuition in semester 1 were also made aware of the resources and invited to avail of them, should any apply. This process identified five individuals: three registered as mature students, one of whom had dyslexia, and a further two students with dyscalculia, though the engagement of one of the students with dyscalculia was sporadic in semester 1. They stopped engaging entirely in semester 2 and did not use the resources.

We did not want to disrupt the relationship and structure of the existing sessions, so students received copies of the appropriate resources and were asked to identify, based on the suggestions in the resource, issues that they would like to address during the sessions. At the beginning of their subsequent meeting, the tutor would then discuss these items with the student, and they collaboratively identified which strategies would be most beneficial. Student feedback was generally not very detailed, but of the four students who participated, the 'use of colour' strategy was most often identified as potentially useful. As a result, this was used throughout the sessions. The three mature students also found this strategy useful, though it was not listed on the mature student resource. The tutor involved in providing the one-to-one support reported positive feedback on the 'use of colour' with most students finding immediate benefits. Students also reported using it independently with their lecture and study notes and with their other subjects. In particular, they reported better recall and understanding of parts of questions when they came to revise them if they had used different colours. All these students agreed to complete a short survey about their use of the resources, but unfortunately none did so.

Across semester 2, three further students who were referred by MAP to the Academic Advisor also indicated that they would like to use the resources. Unfortunately, none of these students subsequently attended their meeting with the Academic Advisor or continued to engage with MAP in relation to mathematics. This leads us to another important open question: 'How do we ensure engagement with academic supports from students with accessibility needs who reveal that they are struggling with mathematics?'

Separately to the use of the resources with students, MLS tutors and staff involved in coordinating MLS services reviewed the resources and recorded comments/feedback in relation to their understanding and practical applicability. These were collated, fed back to the SIG lead, and adjustments were made.

4. Conclusion, Recommendations and Future Work

The sigma Accessibility SIG has made good progress to-date during a difficult period, with a completed international survey and four sets of twin resources used across two institutions. Overall, the feedback from students and tutors about these resources has been positive, but the dataset is small.

While both institutions have different systems in place for providing student supports, they faced the aforementioned fundamental issues:

- How can we improve the implementation of these resources?
- How do we ensure engagement with academic supports from students with accessibility needs who reveal that they are struggling with mathematics?

At MU and UB, we are discussing the advantages and disadvantages of the drop-in and referral systems we used to see if we can identify hybrid strategies which may help to address these issues. Whilst these are challenging questions and it will likely always be difficult to ensure that resources reach their intended audience, it is worth being mindful of the widely-recognised benefit to all students in having more accessibility resources available (Rose and Meyer, 2006). Evidence of this was seen at Maynooth, when mature students engaged with 'use of the colour'. Just getting these resources into MLS is a quick win for many students.

For the next stage in its development, the SIG has decided on a number of measures:

1. The pilot of existing resources will continue over the entire 2022-23 academic year, with the gathering of additional feedback from students and tutors.
2. The SIG will continue to work on the development of further resources, focusing on cognitive disorders, e.g., autism, maths anxiety etc., and sensory impairment, e.g., hearing, sight etc.
3. The JISC Accessible Maths Working Group will be the focal point for the development of technological accessibility. In order to join, see <https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=ACCESSIBLE-MATHS>.

A recent survey paper considered articles submitted to this journal over 20 years (Rowlett and Corner, 2021). Perhaps surprisingly, of the 25 topics identified in their analysis, accessibility issues rarely featured. However, they stated that '*...accessibility remains a challenge for mathematics and statistics, and hope that this focus will continue to be considered by authors*' (Rowlett and Corner, 2021, p. 15). Building on this recommendation, to facilitate its continued work, the SIG is looking for more people from across Ireland and the UK to get involved, especially to assist with the

development and piloting of resources. Further information, including access to the resources developed so far, is available from the SIG webpage <https://www.sigma-network.ac.uk/sigs/accessibility-sig/>.

5. Acknowledgements

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