

UNIVERSITY COLLEGE DUBLIN  
MATHS SUPPORT CENTRE



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Annual Report 2022/23

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## 1 Executive Summary

We first present high level summary statistics of MSC visit data from 2022/23.

- The number of student visits at 2,861 from 896 distinct students was an increase of 22.9% and 21.4% respectively on 2021/22.
- There were just 84 (down from 312) online sessions, 1,511 (down from 1,801) booked face-to-face sessions and 1,181 (up from 215) drop-in face-to-face visits.
- The MSC facilitated 1,973 one-to-one sessions - up from 1,661 in 2021/22.
- There were 174 distinct modules supported - up from 152 in 2021/22.
- Students from all six of UCD's colleges presented at the MSC.
- There were visits from 96 modules not delivered by the School of Mathematics and Statistics accounting for 12% of all visits.
- More than two in three (66.96%) visits were from students registered to level 0 or level 1 modules, a decrease of 10.4% from 2021/22.
- The median time a student spent with a tutor was 25 minutes, an increase of 6.1 minutes.
- The range of student visits went from one to 37. The median number of visits was 6, the modal number of visits was 1 and the mean was 3.19 visits.
- Over 85% of all visits were return visits.
- There were 181 MSC sessions with two students, 65 sessions with three students, and 51 sessions with 4 or more students.
- There were 41 cancelled or no-show appointments from 35 distinct students.
- There were 13 female and 8 male MSC tutors hired, including six undergraduate peer tutors.

## 2 The Year in Summary

In 2022/23 the UCD Maths Support Centre (MSC) continued to provide a hybrid service of physical drop-in, and bookable appointments both online and in-person. Note there was no online drop-in service this year. We saw an increase of 23% in the number of annual visits at 2,861 compared to 2,328 last year, a promising indication that the MSC may be slowly getting back to pre-Covid levels of engagement, when annual visits were commonly in excess of 5,000 visits - see Figure 1. It is interesting

to note that while in Autumn there was no large difference between the number of f2f drop-in visits (804) versus f2f bookable appointments (853) whereas in Spring the number of f2f bookings outstripped drop-ins by 75%. We believe this is due to the message getting out more that booked appointments guarantee 30 minutes with a tutor while drop in visits were conducted on a first-come-first-served basis. While online bookings are low they do serve an important student cohort who is working/studying part-time and is not on campus each day.

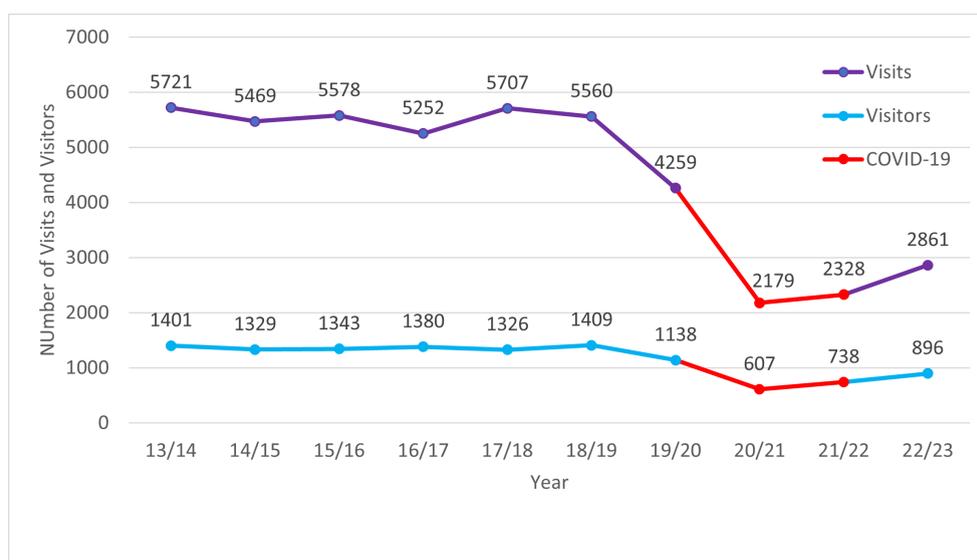


Figure 1: MSC Annual attendance figures for the past 10 years

Figures 2 and 3 show the number of visits for each trimester via the face-to-face formats of bookings and drop-ins, and a details of online bookings and hot topic supports offered at the MSC in 2022/23.

Date	Week	Total visits	F2F Booking	Drop-in	Online booking	Hot Topics	Booking v Drop-in
Dec 5	Week 13	172	119	43	10	0	75% / 25%
Nov 28	Week 12	141	70	53	7	11	53% / 38%
Nov 21	Week 11	248	136	108	4	0	56% / 44%
Nov 14	Week 10	249	92	101	8	48	40% / 41%
Nov 7	Week 9	157	67	88	2	0	44% / 56%
Oct 31	Week 8	144	46	96	2	0	33% / 67%
Oct 24	Week 7	212	88	98	4	22	46% / 42%
Oct 17	Week 6	129	68	57	4	0	56% / 44%
Oct 10	Week 5	133	71	60	2	0	55% / 45%
Oct 3	Week 4	113	58	48	7	0	58% / 42%
Sep 26	Week 3	84	38	44	2	0	48% / 52%
Sep 19	Week 2	8	0	8	0	0	0 / 100%
<b>TOTAL</b>		<b>1790</b>	<b>853</b>	<b>804</b>	<b>52</b>	<b>81</b>	<b>47% / 45%</b>

Figure 2: MSC Autumn trimester attendance figures by format

Date	Week	Total visits	F2F Booking	Drop-in	Online booking	Hot Topic	Booking v Drop-in
01/05/2023	Week 13	96	74	21	1	0	78% v 22%
24/04/2023	Week 12	134	85	47	2	0	65% v 35%
17/04/2023	Week 11	91	46	42	3	0	54% v 46%
10/04/2023	Week 10	83	61	19	3	0	77% v 23%
03/04/2023	Week 9	88	51	33	4	0	63% v 37%
27/03/2023	Week 8	109	64	40	3	2	63% v 37%
06/03/2023	Week 7	78	43	29	4	2	62% v 38%
27/02/2023	Week 6	104	50	51	3	0	51% v 49%
20/02/2023	Week 5	102	63	34	5	0	67% v 33%
13/02/2023	Week 4	95	59	33	3	0	65% v 35%
07/02/2023	Week 3	82	62	19	1	0	77% v 23%
30/01/2023	Week 2	9	0	9	0	0	0 v 100%
<b>TOTAL</b>		<b>1071</b>	<b>658</b>	<b>377</b>	<b>32</b>	<b>4</b>	<b>64% v 35%</b>

Figure 3: MSC Spring trimester attendance figures by format

The preference, at least in the Spring Trimester, of pre-booked appointments over walk-in visits has meant the dynamic of the MSC has changed. We now have designated areas for walk-in and pre-booked visitors. Interestingly, when pandemic-enforced restrictions were fully lifted from September 2022 students continued to pre-book their face-to-face session with walk-in visits accounting for between 45% and 35% of all visits. The following sections present the data pertaining to the UCD MSC for 2022/23.

### 3 Services Offered

Services offered at the MSC during 2022/23 included:

- Students could make a 30 or 60-minute appointment for an in-person support session at the centre and these were limited to one student booking per day.
- Similar offerings were made for group bookings of up to 5 students per booking.
- The physical centre was open for both drop-in visits and appointment-based bookings for 31 and 26 hours per week in the Autumn and Spring Trimesters respectively.
- Synchronous online hot topic sessions were offered for large student cohorts.
- Online bookable appointments for 8x30-minute sessions and 6x30-minute sessions in the Autumn and Spring Trimesters respectively.
- The MSC opened for a total of 24 weeks across trimesters one and two.
- Calculators, books and statistical tables were loaned out.
- In July and August 2022 the MSC ran a series of four 3-hour maths support sessions for incoming Access students (Access to Science, Engineering, Agriculture and Medicine), and Mature student cohorts (Open Learning), supporting over 60 students in the process. This included diagnostic testing and follow-up support using Numbas, the open source e-assessment and feedback system ideal for supporting adult students returning to education.
- The MSC facilitated over 20 hours of dedicated one-to-one support in a private room outside of the MSC, for students with sensory issues registered to the Access and Lifelong Learning Disability Support Service and with students experiencing extreme mathematical anxiety.
- The establishment of Maths Xplained - a 10-week revision programme for leaving cert maths students of DEIS schools - see Section 6.
- The continuation of MathsFit - a Refresher Course, Proficiency Quiz and Hybrid support service for 1,700+ incoming first years studying their first maths module in Business, Agriculture and Health Science, Engineering and Science.
- Weekly anonymous feedback provided to 80+ lecturers and module coordinators on the content of their students' queries at the MSC.

## 4 Governance and Oversight of the MSC

The UCD MSC Oversight Committee met on September 29th 2022. MSC management presented the 2021/22 MSC Annual Report for discussion to University's Management Team via the Student Experience Group on November 22 2022.

Over the summer of 2023 it was agreed that Assistant Professor Richard Smith (UCD SMS) would take over from Associate Professor Maria Meehan (UCD SMS) as MSC Director for the next three years. Maria has been MSC Director for almost 20 years. We would like to sincerely thank Maria for her dedication and expertise in executing this role, and welcome Richard to the committee.

## 5 MSC Tutors

Once again the continued success of the MSC is all due to its talented and committed tutors. We interviewed, trained and hired eleven new tutors for the MSC tutor role while retaining eleven of the 2021-22 MSC staff. Training was conducted over a week via a blend of virtual and in-centre sessions. Also this year six of our new tutors attended a full day online tutor training workshop with the University of Greenwich before completing three 2-hours training workshops locally. Fourteen of our 22 tutors were female. Four of this years' MSC tutor cohort have doctorates in Mathematics or Mathematical Physics, seven tutors were completing their PhD studies in the School of Mathematics and Statistics, five were doing a research MSc/MA in Mathematics/Statistics/Education, and six of our tutors were undergraduate students in 2022/23. Our tutor team represented six countries - Ireland, India, England, Italy, South Africa, and the United States.



Aisling Heanue



Anthony Brown



Ciara Lynch



CJ Clarke



Claire Bergin



Claire Mullen



Colin Smyth



Ellen O'Carroll



Enda Carroll



Eoin Higgins



Hardeep Kaur



Jack McNicholl



Kevin Cunningham



Laura Craig



Matt Nagle



Maya D'Mello



Niamh Fennelly



Oisín Campion



Prabhleen Kaur



Sajal Minhas



Shona Brophy



Giulia Boetti

Figure 4: MSC Tutors 2022-23

## 6 MathsFit

This MSC service development initiated in 2020 was expanded in 2021/22 from 792 students to 1,632 incoming first-year students studying service modules in Agriculture and Health Science, Business, Engineering and Science. MathsFit was initially designed to mitigate the disruption of teaching and learning due to the pandemic-enforced school closures in Ireland in 2020 and 2021, as the MSC had concerns about the mathematical readiness of in-coming university students.

MathsFit is an online suite of resources which includes a mathematical refresher course and proficiency quiz, followed by personalised email feedback on their next mathematical steps. The refresher course and quiz cover three fundamental mathematics areas of Algebra, Arithmetic and Trigonometry, and Functions and Calculus, required by students to succeed at first-year university service maths courses. The proficiency quiz uses best practice in standardised diagnostic testing building on PISA (the Program for International Student Assessment) and tried and tested case studies from Ireland, the UK, the US, Asia and Australia. It provides students and MSC tutors with a snapshot of students' competencies in the fundamental mathematical areas which require mastery for success in their university mathematics courses. MathsFit's key feature is a suite of digital supports to assist students with the transition to university mathematics. This includes short videos, uploaded to the institution's Virtual Learning Environment (VLE) Brightspace, welcoming students to the university and introducing them to the concept and rationale of MathsFit, in addition to an optional online Refresher Course which can be taken in advance of, and after, the Proficiency quiz. Students complete the quiz and surveys through Numbas hosted in Brightspace and then, using the Intelligent Agents and Release Conditions features of Brightspace, receive a personalised support email. This email gave students information about, and links to, tailored mathematics support dependent on their scores (Bronze, Silver and Gold) from MathsFit as well as the opportunity to retake the quiz to measure their improvement. This support encompasses both one-to-one and small group maths support sessions.

While the testing and diagnosing of students' mathematical competencies upon entry to university is quite common, studies concerning follow-up support and interventions for at-risk students are less common. In addition, there is a lack of research exploring and analysing online diagnostic testing, which up until now has usually been conducted live in lecture halls with pen and paper, and subsequent digital student support. Our findings see evidence of strong initial engagement, improved performance in basic mathematics skills and prolonged engagement with both online and in particular in-person maths support throughout the first trimester of first year at university.

## 7 Maths Xplained

This development initiated by MSC manager as part of our outreach commitment was funded by Bentley Systems, UCD Recruitment, UCD Access and Lifelong Learning, and the UCD Library.

Maths Xplained ran for 10 weeks from March 8th to May 17th 2023 for six DEIS (Delivering Equality of Opportunity in Schools) schools linked to the UCD Access & Lifelong Learning Centre. These are schools designated by the Irish Government for funded initiatives that target support at disadvantaged communities, particularly those located in urban areas. We had 49 participating students attend the two-hour sessions each Wednesday evening from 6-8pm resulting in 238 total visits. Tuition is free for students and the students' bus fare to and from UCD is provided, along with healthy food and incidentals like examination papers and stationery items also covered.

This collaborative project sought to support students taking the Leaving Certificate (LC) in June 2023 in their aspirations to progress university. This is primarily to encourage those studying Higher Level to stay the course as 25 bonus points on offer for CAO purposes have meant mathematics is a high stakes subject. Also to ensure Ordinary Level mathematics students continue in their course as dropping back to Foundation level incurs no CAO points in terms of higher or further education pathways. Students come with their own questions and are grouped by subject matter and level of LC mathematics (Higher or Ordinary)

Huge thanks to Aine Murphy from UCD ALL for coordinating the programme, Debra McCann from JJ Library for facilitating the students entry each week, and the maths support tutors Aidan, Cristina, Deebea, Emily, Finnegan, Kelly, Oisin, and Rachel.

## 8 Events, Research and Communications at the MSC

- Deputy principal Andrew McKimm from Blackrock College Dublin and a number of maths teachers spent an in-service day with us in October 2022. Discussions surrounded the difficulties students experience in leaving certificate mathematics and in-coming first year university students, particularly in engineering and science. The teachers were also interested in the strengths and weaknesses of "Project Maths" after ten year of the secondary level curriculum reform initiative.



Figure 5: Mathematics teachers from Blackrock College at the MSC

- In January 2023, the MSC submitted a case study to the Erasmus+ Project SURFY project (Supporting Under-represented First Year's with UCD lead Therese Fitzgerald). The project aims to increase access, participation, and success of students from under-represented groups/disadvantaged backgrounds via developing a database of best practices in student support that can be shared with other educational institutions. It is envisaged that the database will be a resource where colleagues can search by theme or group to access shared resources/case studies/initiatives. UCD are working with two other European Universities on this project, Artevelde University of Applied Sciences in Belgium and the University of Southern Denmark to map, collect and describe student support services/initiatives across the three universities. The initiative is funded by the European Union. The MSC initiative MathsFit has since been shared amongst the European network as an example of best practice in identifying and supporting at-risk students in mathematics and in running a mathematics and statistics support centre at university.
- MSC tutor Claire Mullen received The UK and Ireland Mathematics and Statistics Support Networks Award for Excellence for 2022/23.

- MSC tutors Oisín Campion and Claire Mullen completed the National Forum’s Digital Badge in Universal Design for Learning.
- Research outputs related to the work conducted at the MSC were disseminated by MSC management and tutoring staff in 2022/23 included:
  1. Mullen, C., Pettigrew, J., Cronin, A., Rylands, L. & Shearman, D. (2023). Optimising the blend of in-person and online mathematics support: the student perspective. *International Journal of Mathematical Education in Science and Technology*.
  2. Mullen, C., & Cronin, A. (2022). A university mathematics transition programme designed to increase student engagement with mathematics support. In J. Hodgen, E. Geraniou, G. Bolondi F. Ferretti. (Eds.), *Proceedings of the Twelfth Congress of the European Society for Research in Mathematics Education (CERME12)* (pp.2463-2470). Free University of Bozen-Bolzano and ERME.
  3. Mullen, C., Howard, E., & Cronin, A. (2022). Protocol: A scoping literature review of the impact and evaluation of mathematics and statistics support in higher education. <https://doi.org/10.17605/OSF.IO/2SP7M>
- MSC management and tutor staff hosted the Sustaining Accessibility in Mathematics conference on March 24 2023, the first of its kind to be held on the island of Ireland. This was attended by 81 delegates including 26 online with participation from 39 institutions including Ireland, Northern Ireland, England, Scotland, Wales, USA, and Australia.
- The UCD MSC hosted visitors from the Beijing Dublin International College to outline how the centre runs and the type of student engagement experienced in the centre.
- MSC manager presented at the annual CETL-MSOR conference, at the University of Dundee, Scotland in September 2022, and at CERME13 in Budapest in July 2023.

## 9 MSC Student Feedback Survey

The MSC ran two short surveys with MSC users at the end of both the Autumn and Spring trimesters. The Autumn survey was sent to 677 Autumn Trimester users resulting in a 12% response rate while the Spring survey was sent to 378 Spring Trimester users with a 9% response rate. Both surveys asked students to: Give one thing the MSC does well and give one thing the MSC could improve upon.

Responses to the positively framed question came under the themes of:

- Tutors (approachable, non-judgmental, energetic, encouraging, efficient)
- Hot topic sessions for specific modules and topics very helpful
- Group work facilitation
- Raised confidence for examination preparation
- Organisation and ease of bookable appointments

An indicative statement from the positive comments reflected the success of the MathsFit initiative was “The fact that I was contacted so quickly and offered help was great”.

Students asked for improvements in:

- The size (too small) and unsuitability of the MSC as a social learning space
- Allowing MSc, stage 3/4 students use the MSC
- Better wifi in the centre
- More tutors and more Physics-based tutors
- An online chat facility

We fully accept and regret that the physical MSC space is too small to accommodate more supervised group learning, and we hope this will improve when further refurbishment plans for the JJ Library develop.

## 10 Plans and Recommendations for 2023/24

1. We propose encouraging students to make a booking where possible as opposed to a drop in visit to allow for more efficiency of the MSC service.
2. We recommend sustaining the online MSC service for students whose visit to Belfield campus is problematic. Thus we plan to offer 5-10% of our MSC service hours online for Autumn 2023/24.
3. Given the constructive criticism of the MSC space from our service users we recommend the MSC continue its proactive lobbying for a new and bigger home within the JJJL or in the proposed UCD Centre for Future Learning despite building delays there. While international best practice for university-wide maths support services states they be housed in a central location, the JJ Library environment and size of the space is not conducive to academic

support given its small capacity, poor ventilation, absence of natural light, and limited scope for peer-to-peer learning.

4. With permission from module coordinators from September 2023 the MSC will advertise MathsFit across four of the largest Autumn Trimester first-year modules delivered by our school. This entails presenting the rationale of MathsFit and advertising the MSC at 36 tutorials in week 1 of Trimester 1. Here students meet their tutors, engage with the basic refresher course and start their MathsFit Proficiency Quiz gaining up to 3.3% of course credit.

## 11 Conclusion

In summary 2022/23 has seen an new era of student engagement with the services where more than half of all visits were by appointment. We welcome this innovation as it means visiting students are more prepared for their visits and it allows tutors some preparation to best target their intervention. Innovations, such as the YouCanBookMe appointment based booking system, synchronous online hot topic sessions for large cohorts of students, and the flexibility that virtual support has in terms of space and time for certain cohorts of students will be maintained. We look forward to meeting new challenges 2023-24 brings and continuing to support our undergraduate students with their mathematical and statistical queries.

## 12 Appendix

UCD Maths Support Centre Oversight Committee Terms of Reference  
Version 4.0 - September 2022

Composition of the committee

Maths Support Centre Director - Maria Meehan

Head of School - School of Mathematics and Statistics (SMS) - Ted Cox

Head of Teaching and Learning (SMS) - Michael Mackey

Mathematics subject representative (SMS) - Mark Dukes

Statistics subject representative (SMS) Claire Gormley

Applied & Computational Mathematics subject representative (SMS) - Barry Wardell

UCD Teaching & Learning representative - Aine Galvin.

Conduct of Business

The chair should be Head of School or nominee to serve for a minimum of three years. The oversight committee may co-opt representatives from across the University as appropriate. The manager of the Maths Support Centre (MSC) will be

invited to attend certain meetings or parts thereof to inform the committee.

The oversight committee shall meet at least twice a year. The meetings shall be convened by the Chair with a minimum of seven days notice of a meeting. Minutes/agenda items shall be disseminated/requested by the chair.

#### Reporting

To report to the University Management Team Student Experience Group (UMT SEG), on an annual basis (usually November/December) via the MSC Annual Report. The oversight committee will also report, via the Annual Report, to the SMS Teaching and Learning Committee for discussion and subsequently to the SMS Executive (for noting).

#### Terms of Reference

- Provide academic oversight to the MSC
- Provide oversight in relation to
  1. Service delivery
  2. Staffing
  3. Communications and relationship building
  4. Financing
  5. Reporting
- To assist and support MSC strategy development, in keeping with UCD's Strategy 2020-2024 'Rising to the Future' to ensure high quality mathematics support provision service for undergraduate students registered at UCD.
- Monitor, review and report on the progress of the MSC in achieving its objectives.
- To consider and respond to issues referred to the committee by UMT, School of Mathematics and Statistics, and other relevant stakeholders.