



2004 - 2014

MSC Annual Report 2013-2014

Including: Ten Years of Mathematics Support at UCD



Manager: Dr Anthony Cronin

Director: Dr Maria Meehan

2013/2014

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Mission Statement

The UCD Maths Support Centre (MSC) offers free, non-judgemental academic support to any student registered to UCD who needs assistance with a mathematical or statistical component from their programme of study. We endeavour to guide the student on a path of self-directed learning. This eases the transition from secondary to tertiary education for our first year visitors as well as providing support to visitors from later years.

Our core objectives for 2015-2020 are:

- To enable students to achieve and discover their full mathematical potential.
- Build an evidence-based research profile which will inform our practice.
- To align with the UCD Strategic Plan 2015-2020 and become world-class in the area of maths and statistics support.
- To contribute to the University's strategic plan in developing graduate skills by providing our students with the requisite numeracy attributes.



Dr Maria Meehan
MSC Director

Executive Summary 2013-14

The Mathematics Support Centre (MSC) offers support in mathematics and statistics to students from all programmes in UCD not just those studying in the School of Mathematical Sciences. This includes students at all levels from Access programmes to PhD students and includes mature students and those with learning disabilities.

This year the number of recorded visits to the MSC was 5,721* an increase of 20.44% on last year's total. The attendance by any one student ranged from 1 to 85 visits and 68% of students visited 5 times or more. The total number of modules represented at the MSC was an unprecedented 315, and 109 of these modules had 5 visits or more. The percentage of visits related to statistical queries was 17.96%, an increasing trend.

Students from Stage 1 formed the majority of attendees at 48% of the total number, an increase of 7% on the previous year, while 26% of visits were from Stage 2 students, 23% Stage 3 or higher (including 4% from postgraduates) and the balance of 3% were from pre university Access to Science and Engineering programmes.

*The manager ran an experiment over both semesters which indicated that the actual number of visits to the MSC is estimated to be 20%-25% larger in reality. This is due to a number of reasons including; one student logging in on behalf of a group of students and the main issue of students never logging in, receive math support, then leaving so their visit is never recorded. Plans are underway to correct this using a more sophisticated data management system which should be in place for January 2015.

*5,721 visits in Academic Year
2013/2014**



*Visits from 315 modules across
the university*

*48% of all MSC visits from Stage 1
students*

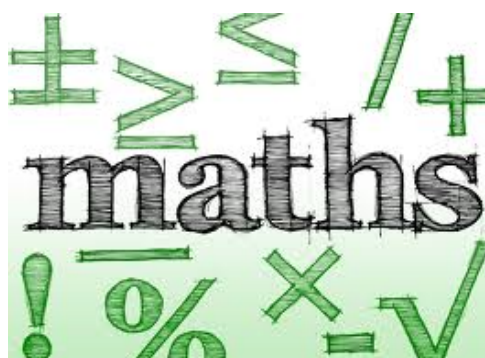
Executive Summary

The MSC opened 29 hours per week Monday to Friday in the first semester hiring 19 tutors in the process. In the second semester we reduced our number of tutors to 14 while keeping the same number of opening hours. This allowed money saved to be used in the last weeks of drop-in to employ extra tutors for the busy revision and exam weeks. Some 16 hours of extra tutoring were provided per week for the last four weeks and this included the MSC remaining open through the lunch hour, the MSC having satellite locations running concurrently around campus and opening on the two Saturdays during exam time. This timetabling proved very successful. But this arrangement depends on the availability of extra tutors at the end of semester. It is important to note that this is not always possible and alternative solutions may need to be employed.

A further method of creating more efficient use of the MSC hours is the use of Hot Topic sessions. If lecturers or students identify a particular area in which students are having difficulty, the MSC, with the agreement of the lecturer, designs and delivers Hot Topics in this area. This year the MSC ran 15 Hot Topic sessions (10 in semester 1 and 5 in semester 2) including 5 for statistics, one for structural engineering and architecture and one for the Business School. The Hot Topics were run in the following areas: Discrete and Continuous Random Variables, Trigonometry and Resolving Forces, Exponentiation and Logarithms, Probability, Eigenvalues and Eigenvectors, and Differential Calculus. It is recommended that by increasing the number of these sessions and organising them earlier in the semester, it may help to decrease the number of one-on-one sessions required in the MSC.

In April 2014 the MSC wrote a letter to the Registrar detailing the urgent need for a significant increase in funding for the MSC to cope with the 20% increase in visits. At the time of publishing this report we are very happy to report that this request has been approved.

19 tutors hired for Semester 1 in the academic year 2013/2014



*Open 29 hours per week
15 Hot Topic sessions*

Funding increase sought & approved

Executive Summary

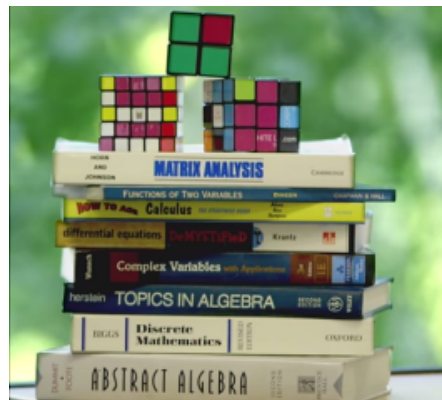
The MSC database is now entering its sixth year of data collection. This data is a valuable source of information for research purposes. The previous manager Nuala Curley started her PhD, analysing this data, in September 2013 and has been awarded a PhD Research Demonstratorship under the supervision of the centre's director Dr Maria Meehan. The topic for her research is "identifying university students' mathematical 'trouble-spots' and developing effective supports: an analysis of Maths Support Centre data." The new manager Dr Anthony Cronin was appointed in August 2013.

February 2014 was the 10th anniversary of the opening of the MSC. From February 2004 to August 2014 the total number of visits to the MSC was over 28,000. During this period the MSC has changed location 6 times. Our ongoing concern is the provision of a permanent venue of sufficient size, located in an area readily accessible to the students. Our change of location to the Library Link in the James Joyce Library has been a very beneficial move.

After the MSC re-location to the library not only did we observe a substantial increase in numbers attending compared to the same time last year but we also noted an increase in attendance by students studying modules other than those with an ACM/MATH/MST/STAT code. These non-mathematical modules represented 21% of the total number of visits.

We would like to thank the James Joyce Library for allowing us to use this venue and their staff who are constantly helping the MSC with IT, signage, furniture, and photocopying issues among others. However it is essential that planning ahead for a suitable location within the proposed Newman-Joyce Precinct is maintained as a priority. This will ensure that the MSC regains the necessary autonomy over its operation which has been diminished since the move to the library.

Evidence-based research using the MSC Data Management System



Over 28,000 visits in 10 years

6 different locations

21% of all visits emanate from non-maths modules

Dedicated MSC space a priority

Executive Summary

The MSC assisted the UCD Access Centre by developing and delivering pre-semester mathematics workshops for both incoming 2013/2014 Higher Education Access Route (HEAR) students and two separate workshops for Mature students. The MSC also ran three nights of Hot Topic sessions for the UCD Adult Education Centre's Access to Science and Engineering students. All these pre-courses were very well attended and the feedback from the students has been hugely positive*.

The Manager also spoke to the Disability Access Route to Education (DARE) students and registered these students with the MSC. This made it easier for these students to come to the MSC when they needed help. The MSC data shows that visits to the MSC by students from the UCD Access Centre for Disability Support was 226.

The fact that the MSC pervades the entire university is evidenced by the following UCD programmes which were represented by students attending the MSC this year: Actuarial and Financial Studies, Animal Science, Archaeology & Geology, Architecture, Arts, Agriculture, Business and Law, Commerce, Chemistry, Computer Science, Dairy Business, Economics, Economics and Finance, Engineering, Food Science, Forestry, Health and Performance Science, Geography, Horticulture, Landscape & Sports Turf Management, Law with Economics Mathematics, Mathematical Physics, Medicine, Nursing, Physiotherapy, Psychology, Radiography, Statistics, Sociology, Social Science, Sports and Exercise Management, Veterinary, and Veterinary Nursing.

In total 52 nations were represented by students attending the MSC last year. International students often have language difficulties, and they frequently attend the MSC to further their understanding of lecture notes.

*The feedback survey results on these precourses are available from our website at www.ucd.ie/msc

Summer workshops for Access, Adult, HEAR and DARE students



226 visits from students registered with Disability Support

The Maths Support Centre pervades the entire university

52 nationalities represented at the Maths Support Centre

Executive Summary

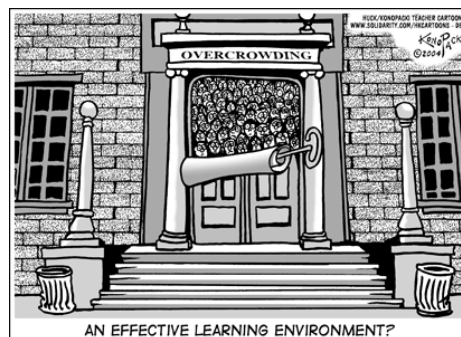
Once again this year, an MSC Evaluation survey was sent to all the students who had attended the MSC in semester 1 of 2013/2014. The students were emailed in January 2014. There were 399 responses from 836 solicited (a 48% response rate). The results of the evaluation were very encouraging. (See page 23: Student Evaluation of MSC.)

In conclusion the MSC is currently more than fulfilling its stated aims. Students show a very high level of satisfaction with the mathematical support provided. To continue coping with the increasing demand, an increase of this year's budget was sought and granted, a further sign of how important the university authorities see the MSC service. However, the fact that the MSC changes its venue on average every two years is a serious issue with cost implications not purely financial. The MSC urgently requires a secure tenure of sufficient size, in a suitable area frequented by the students. Future planning for the MSC is curtailed because of the lack of a permanent location, though meetings on the proposed Newman-Joyce have been attended by the MSC director and manager.

We believe that the MSC represents a model of best practice for the provision of academic support within UCD. Indeed this summer the director, manger and previous manager all presented their research, related to MSC data, at the UK's leading conference on Mathematics and Statistics Support provision (CETL-MSOR) which received high praise from the community and showed that the UCD MSC is in fact an internationally renowned centre of excellence.

48% response rate to Student Evaluation survey

A permanent dedicated home within the Newman-Joyce Precinct is required for future stability



10 Years of Maths Support at UCD

Origins of the Maths Support Centre

In 2003 the Department of Mathematics secured Higher Education Authority (HEA) funding for the establishment of the UCD Maths Support Centre. A manager was appointed in February 2004 and the Maths Support Centre was opened on 16th February 2004. Further HEA funding was sought and awarded in 2004 and 2005. A full-time manager was appointed in September 2007. A new manager was appointed in September 2013. University College Dublin has funded the MSC since September 2007.

Initial aims of the MSC

1. Provide mathematics support for students of all mathematical abilities, on a one-on-one or small group basis, in a friendly, relaxed and informal atmosphere.
2. Enable students who are experiencing particular difficulties in mathematics to overcome their fear of the subject, take control of their own learning and build confidence in their own mathematical ability.
3. Ease the transition of first year students from secondary-level to tertiary-level mathematics.
4. Provide targeted mathematics support for Access students, HEAR (Higher Education Access Route) and DARE (Disability Access Route to Education) students, mature students, and students with learning disabilities.
5. Increase its effectiveness by evaluating its activities and communicating and co-operating with other mathematics support centres in Ireland and the UK.

Past Managers



Dr Ronan Flatley (MI Limerick) February 2004 to July 2005



Dr Kevin Jennings (NUIG) April 2006 to August 2007



Nuala Curley (UCD) September 2007 to August 2013



Dr Anthony Cronin September 2013 to present

The Background

Locations

The MSC was initially set up in 2004 in a small office in the John Henry Newman Building. In 2006/2007 the MSC was relocated to a room on the ground floor of the Physics building. However, due to development of that area, a room in the Science Lecture Building was allocated to the MSC in 2007/2008. In 2010 that room was extended to twice its size. In October 2011, due to development of the Science Hub the MSC changed location again - this time to a large bright room in the old wing of Science Centre South. An area in this room was sectioned off for the Manager. However, in the second semester this location became in reality a building site and difficult to find. The number of students attending was considerably reduced. This would have been particularly true for first years that might not have experienced the benefits to their study that the MSC offered. During the midterm break of the second semester in 2012/13 the MSC was relocated to the Library Link in the James Joyce Library. The Library location is *central, neutral and highly visible*. Footfall is up **20.44%** since we moved here, with just under 6,000 visits this academic year of 2013/14.



Services provided

Dedicated drop in centre staffed by friendly and supportive tutors

One-on-one tuition or group tuition as required

Supervised study

Hot Topic Sessions

Relevant textbooks and useful handouts

Web-based learning materials including self-diagnostic tests

Dedicated MSC Blackboard site

MSC-developed question and answer resource sheets

Outreach Programmes

Hosting of UCD MathSoc events and study groups

The Future

Challenges for the future

Increase in numbers

63% average growth in the number of visits to the MSC from 2009 to 2014 (3,508 visits to 5,721 visits). 20.44% increase growth in number of visits from 2013-2014 (4,750-5721).

Increased demand of Hot Topic Sessions

Over 450 students availing of 10 Hot Topic sessions which is the most the centre has ever run in a single semester (Sem 1 2013-2014).

Increase in Satellite Sessions

Satellite MSC sessions run for Statistics, Maths for Business and ACM (Applied & Computational Mathematics) modules.

Reduction of opening hours

Decrease in number of opening hours per week from 33 to 29 hours currently. It is important to re-establish opening hours and ensure that the MSC is open outside semester times.

Increased waiting times for students

Qualitative feedback from MSC visitors report that a large portion of students are frustrated by the waiting time to see a tutor and the lack of tutors at busy periods.

Increase in service offerings and outreach

Pre-Semester 1 Hot Topic sessions for incoming HEAR and Mature Students.

Outreach Activity - 30 Leaving Cert students (paying €25 each) generated €750 to cover tutor costs. Three secondary schools (DEIS*) were visited by MSC tutors to provide maths tutoring.

Record keeping

As a result of random sampling by the manager in both semesters of 2013-2014, it was noted that between 20-25% of students' went unrecorded. This is a major challenge in ensuring accurate research results.

Solutions to this problem will be piloted in Semester 1 of 2014-2015.

Manage increase in visits by diversifying our supports e.g. video creation & Peer-Assisted Tutoring



Re-establish opening hours to 33 hours per week

*Improve waiting times of students to be seen by a tutor
Increase number of tutors*

Increase the number of Outreach activities to the wider community

Modernise the MSC Data Management System

*Delivering Equality in Schools

The Future

Strategic Plan 2015-2020

The MSC is in the process of developing a 5 year strategic plan to ensure we become the world leader in mathematics and statistics support.

Part of this plan is to ask the Registrar for clearer administrative and academic oversight. The MSC is now in its 11th year of operation, experiencing unprecedented levels of demand from all student cohorts across the university and it is clear we need the appropriate level of governance at the university level.

Publicity

A video piece of the MSC showcasing its activities and excellent tutors, produced by the UCD Inspired Learning Series will go online in November 2014.

Website & Digital supports

Extensive work has been conducted on the MSC website www.ucd.ie/msc to improve the students experience of the MSC outside centre hours, features include:

1. GeoGebra interactive applets to help students visualise mathematical graphs.
2. An MSC YouTube channel where MSC students can access videos (created by MSC staff) on the basics of mathematics.
3. A dedicated Blackboard page for MSC users.
4. WeBWork to be embedded in the MSC site from semester 2 of 2014/2015.
5. Free access to Wiley+ mathematics and statistics software for all MSC users from January 2015.
6. Self-diagnostic tests and feedback.

Opening Times

Monday 10am to 1pm and 2pm to 6pm

Tuesday 10am to 1pm and 2pm to 5pm

Wednesday 10am to 1pm and 2pm to 6pm

Tuesday 10am to 1pm and 2pm to 5pm

Friday 10am to 1pm



*GeoGebra, WeBWork, Wiley+,
MSC Blackboard site*

The Background

The MSC is committed to research and evidenced-based practice. The manager has presented research based on MSC data and practice at several national and international conferences in 2014, some of which are listed on the right hand side.

Widening participation

From 2012 the MSC has developed and run special tutorials on basic mathematical topics for students entering UCD by both higher education access route (HEAR) and the Mature student access route in the week prior to orientation. From 2013 we have also offered 3 nights of support in basics mathematics and statistics for Access to Science and Engineering students which run in August.

In 2014 for the first time the MSC opened its doors to second level students. In particular the 2014 Leaving Cert class were invited to take part in maths support sessions, specially designed to handle Project Maths type queries. 35 students attended these sessions including 6 students from DEIS designated schools.

In 2014, MSC tutors also visited three schools in the areas of Tallaght, Blanchardstown and Ballyfermot delivering maths instruction to higher level leaving cert students.

SPARC Initiative

SPARC is a UCD Teaching and Learning pilot initiative to facilitate the delivery of projects through staff/student partnerships. The MSC plans to invite Transition Year students from surrounding post-primary schools to play games and solve puzzles which involve mathematical and strategic problem solving skills. This project will create a legacy for the MSC and UCD in promoting mathematics and statistics to potential UCD students of the future.

MSC research presented at:

Cardiff	CETL-MSOR September 2014
Bern	Adults Learning Maths - June 2014
DIT	SEFI Conference - June 2014
UCD	EdTech & ILTA - May 2014
UCD	Straight Talking Science - Mar 2014
UCD	Work Smarter Together - Library/MSOR poster winner 2014

Conferences attended: 2013/2014

B'ham	CETL-MSOR - September 2013
UCD	Blended Learning in large class context - May 2014
UCD	Communicating your research via digital media - March 14
CIT	E-Assessment - May 2014
NUIM	Symposium on research into aspects of mathematics teaching - June 2014
NUIM	Getting started in pedagogic research in STEM - May 2014
NUIM	Teaching and Learning seminar on developing pedagogical research skills in STEM disciplines - May 14
DCU	3U N-Step - Transitions in STEM September 2014

Students' engagement with the MSC

Annual visits to the MSC since 2004

Annual attendance at the MSC has once again increased. The number of visits to the MSC has grown steadily each year. (See Figure 1: Annual number of visits to the MSC.) In 2013/2014 the number of visits to the MSC was 5,721, an increase of 20.44% on last year's total.

UCD first funded the MSC in 2007/2008 and in that year there were 1,142 visits. This year the number of visits has increased threefold on that figure to 5,721.

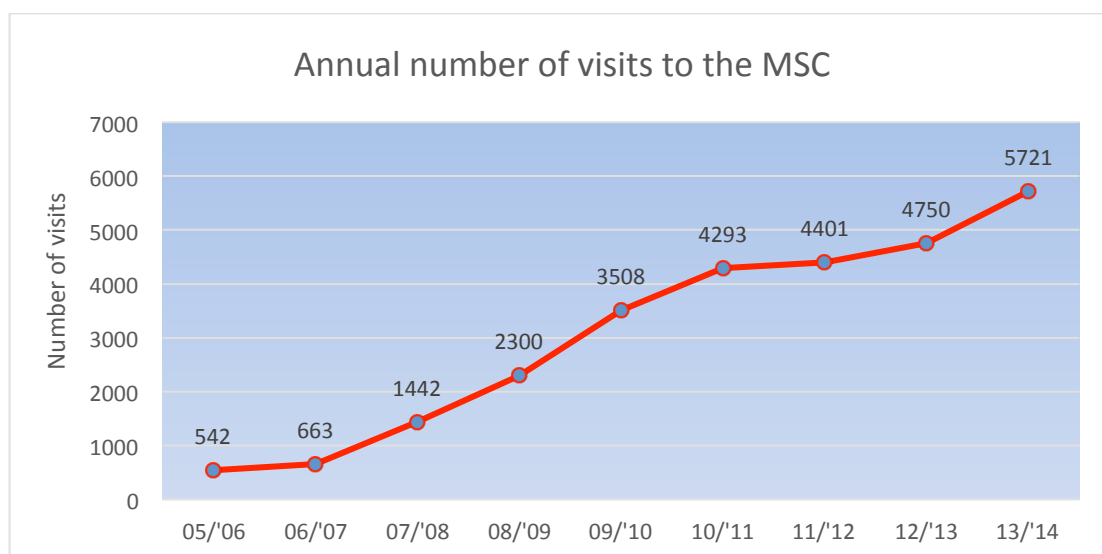


Figure 1: Annual number of visits to the Maths Support Centre

Students' engagement with MSC

The number of Semester 1 Maths Support Centre visits are up 29.3% (2443->3161), on the same period from 2012/13. See Figure 2.

Semester 2 visits were also up on the previous year from 2,315 to 2,584 an increase of 11.6%. See Figure 3 below.

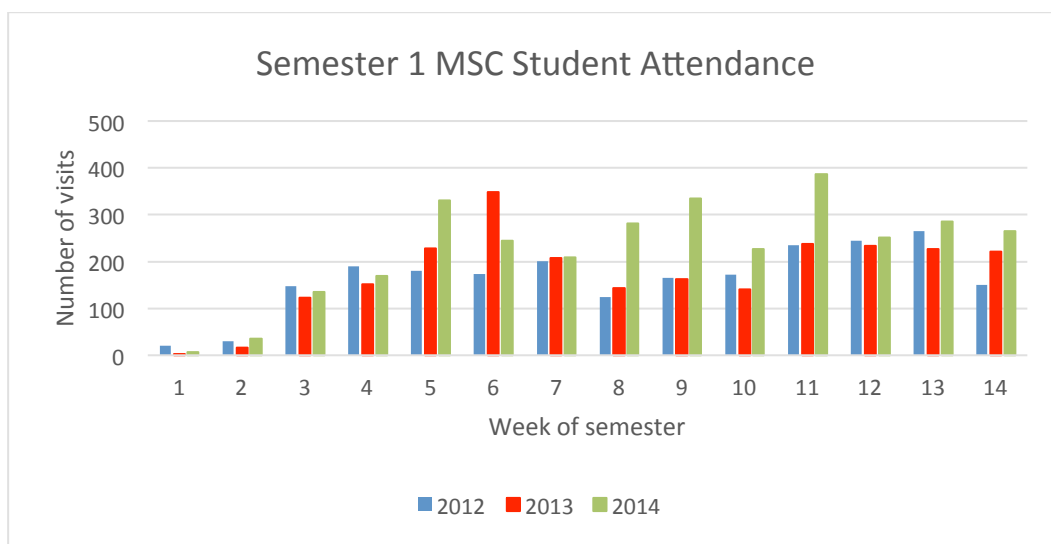


Figure 2: Semester 1 Maths Support Centre Attendance

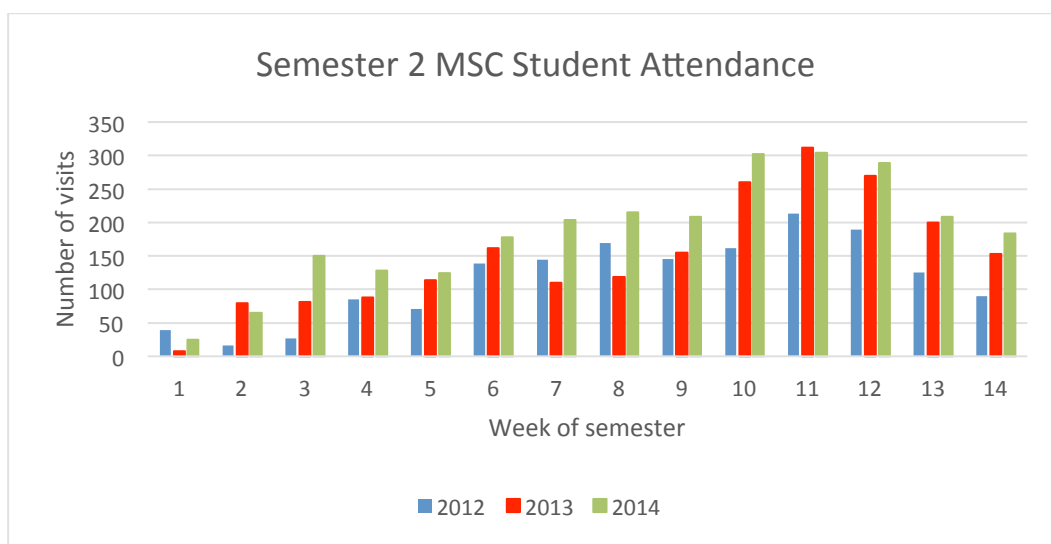


Figure 3: Semester 2 Maths Support Centre Attendance

Students' engagement with MSC

The number of individual student visits to the Maths Support Centre for the last three years is detailed in Figure 4 below. The largest number of visits by one student was 85 last year. The modal number of visits was one.

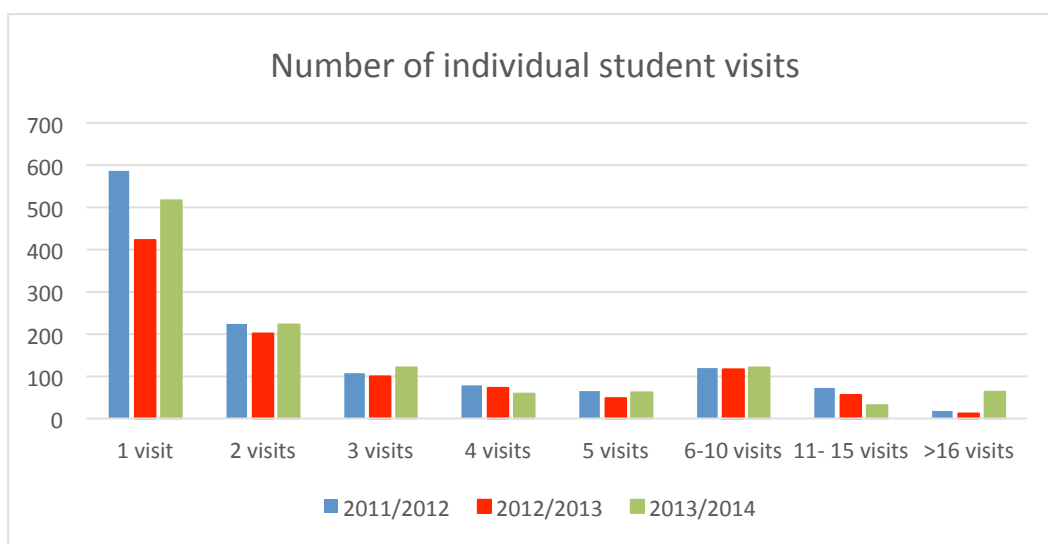


Figure 4: Individual visits to the MSC

Statistics visits on the rise

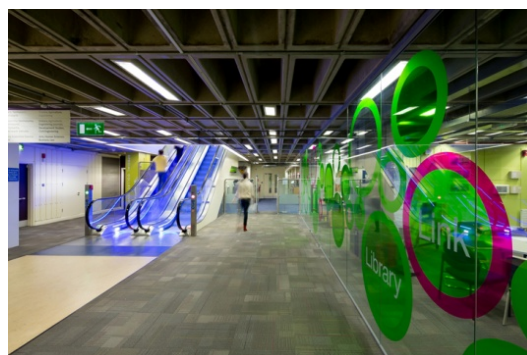
In 2013/2014, 17% of all visits were from students with statistics related queries. Many of these queries take longer than the average visit duration due to the nature of the discipline. Many statistics queries can be very involved including final year and postgraduate projects which require our tutors to assist with software packages like SPSS, R, Excel, Minitab etc. As a result more statistics tutors are required in the centre as we do not always have a statistics tutor on duty.



Students' engagement with MSC

History of Usage

When the MSC was established in 2004, it was expected that the majority of visitors to the centre would be Stage One students enrolled on a mathematics course/module. While a significant number of visitors to the MSC in 2013/2014 still fit this profile, we have again observed that students from programmes such as Psychology, Radiology and Social Science, where mathematics modules are not core, are attending the MSC with mathematical problems or issues they meet either in mathematical electives or in non-mathematics modules. Engineering and Science students accounted for 30% and 24% respectively of all visits in Semester 1 2013/2014.



After the MSC's re-location to the library on the 25th March 2013, students visiting the MSC represented a total of 315 modules as compared to 171 the previous year. Worthy of note is that 193, approximately 61%, of these modules did not have a ACM/MATH/MST/STAT module code. The previous year this figure for the same period was 48% of the modules.

Table 1 below represents these numbers:

Number of different modules attending the MSC in 2012, 2013 and 2014		
2014	ACM/MATH/MST/STAT	122
	Others	193
	Total	315
2013	ACM/MATH/MST/STAT	64
	Others	107
	Total	171
2012	ACM/MATH/MST/STAT	54
	Others	50
	Total	104

Visits from 193 non-math modules

Table 1: MSC Module Attendance

Students' engagement with MSC

In the data below we have included in modules at stage zero the numbers from Access to Science, Access to Engineering and also level zero modules for example MATH00010. Zero level modules are introductory modules intended to help incoming students to understand and master those topics from Leaving Certificate mathematics that are necessary for successful engagement with the School's level 1 modules in mathematics.

***Stage = Year of study**

In Table 2 below is a comparison of student attendance over the last three years. The increase in Stage 3 and Stage 4/5 are noteworthy.

	2011/12	2012/13	2013/14
Stage 0	3%	9%	3%
Stage 1	53%	44%	48%
Stage 2	33%	25%	26%
Stage 3	7%	17%	15%
Stage4/5	4%	5%	8%

Table 2: MSC Attendance by stage

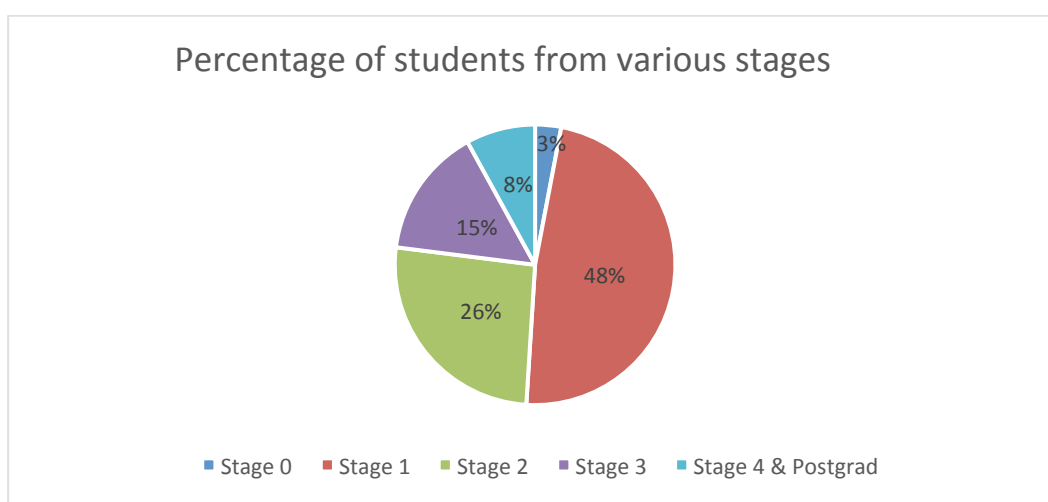


Figure 5: Percentage of students from various stages

Students engagement with MSC

Equality of opportunity

The continued close co-operation between the Student Advisers and the MSC has proved to be very effective. The MSC and the Student Advisers were in frequent contact during the year.

Our database showed that there were 226 visits by students from UCD Access Centre for Disability Support this year. We approached the Disability Support Access Centre and they kindly agreed to run a staff training workshop for our new MSC tutors in September 2013.

Once again this year the MSC developed and delivered six mathematics workshops for incoming HEAR students in August 2013. These were for those students who were entering academic programmes with some mathematical element. They were organised at a higher and lower level. The first, which was for those students coming in with Ordinary Level Leaving Certificate (LC) Mathematics, was a basic mathematics workshop. For those who had taken Higher Level LC Mathematics there was a statistics workshop. A further benefit of these courses was the familiarity of the students with the MSC tutors which meant they had no qualms about attending the MSC when they needed its services.

The MSC also ran three nights, each consisting of 3 hours instruction from 4 senior MSC tutors, for the incoming Access to Science and Engineering students (who now do two maths modules as opposed to one as was the norm before 2013) for the UCD Adult Education Centre. These were attended by over 40 students each night with pre and post diagnostic tests (designed by MSC staff) conducted on the first and last nights.



MSC tutors receive training from the Access Centre to assist with Disability Support students

Mathematics workshops

Students engagement with MSC

Equality of opportunity

The Manager also spoke to the mature students at Orientation day in September 2013 informing them of the MSC facility and advising them of the self-assessment tests on the MSC website. These are designed to help incoming students revise their second level mathematics. Mature students may either have forgotten a lot of the mathematics they once knew or else may not have reached the required standard. The MSC developed and delivered a mathematics course in September to students entering UCD in September 2013 as mature students. The students were informed of the topics that would be covered and invited to attend those they felt were relevant to their needs.

Mature students are normally well motivated but need assistance which can often most effectively be given on a one-on-one basis. This however can be difficult when the Centre is busy. In light of the current financial situation in the country the number of Mature and Access students may rise and the support given by the MSC could be a critical factor in allowing them to complete their programme to degree level.

In their evaluations both Mature and Access students commented on the patience of the MSC staff. The tutors emphasize the importance of understanding mathematics and take as much time as they can with each student. The MSC strives to give their students a mathematical understanding of their topic but this does require time spent with a student.

"I would have been lost without the Maths Support Centre and am so grateful for all of the help I received. Maths is an awful lot clearer to me now and I feel a lot more comfortable and confident in my class."

"The staff at the MSC were always very helpful and encouraging. They are doing a great job, as they seem under pressure to service the amount of people who are seeking their help."

Students engagement with MSC

Visits to the MSC by international students

The MSC set up an information desk at the orientation day run by the international office.

What is evident from our data each year is the number of different nationalities who attend the MSC.

Fifty-two countries were represented this year.



Identifying areas of greatest need: Hot Topics

If lecturers or students identify particular areas in which students are having difficulty, the MSC with the agreement of the lecturer, design and deliver Hot Topics in these areas. Hot Topics are normally two hours in duration, held in evening times and lecture rooms were normally booked to host these sessions as the MSC space in the Library Link proved too small. The MSC ran 15 Hot Topic sessions over the academic year on concepts ranging from *Resolving Vectors*, and *Indices to Vector Geometry* and *Continuous Random Variables*. In total over 500 students attended these 15 Hot Topics. In future we have decided to cap the attendance at these sessions to 20 students and to target the very weakest students in the module so as to maximise the effectiveness in supporting these students who are at risk of failing that particular module. Lecturers from modules in Engineering, Architecture, Business and Physics have expressed great satisfaction at the support offered to their students via these sessions.

“Thank you for all the great support for maths and being able to explain hard maths and make it understandable to those who had not studied it for years and years. I LOVED maths. Even way back last August when you ran sessions (Hot Topics?) for us prior to the access course beginning, you were exceptional and so very patient with those of us who were so very rusty in our basic maths! You run a fantastic service in the MSC for the students. Without the MSC I would have been floundering in Maths.”

Students engagement with MSC

Retention Figures

In January 2014 the manager of the MSC, in agreement with the various Module Coordinators targeted all those students who failed a module delivered by the School of Mathematical Sciences in semester 1. These 388 students were emailed via Targeted Communications as a reminder that support is available to them at the MSC in getting assistance to pass their resits. Of this cohort, 37 had visited the MSC in semester 1 and this number grew to 59 by the end of the summer of 2014.

Often you will hear very able students remark that they could never do “maths”. This lack of confidence in their mathematical ability and the related stress may also be a factor in causing them to drop out. Yet with the right help they can move on to at least, be capable mathematically and hopefully to enjoy it. Sometimes it is just that they need the extra support to adjust to third level and are often shy about looking for help. One-on-one support is particularly important for these students. It is essential that the MSC is seen as a place where you can always go no matter how low you feel your level of understanding of the module may be. Many students commented on the importance of the MSC in helping them gain this confidence. One student describes her experience of the MSC in the quote on the right hand side.

“I had a very low level of maths to start off with and very little time to catch up. When I went there I was embarrassed to let them know how little I knew and as a result spent the first couple of sessions nodding along to things I didnt really understand but (with) their patience and understanding I soon found the confidence to vocalize what I didnt know and ask questions. If it were not for the maths support center there is no way I would have passed my exams.”

Student evaluation of the MSC

We surveyed the 836 MSC users in semester 1 and had a 48% response rate. The following 10 questions were put to the students using the online software, Survey Monkey. See all results shown below:

1. What is your opinion on the current location of the MSC?

"The location is good, as you go to the library to study. However it is too small, at exam time it is hard to get a space. Also the tutoring for stats is VERY VERY limited there should be more time available and more than one stats tutor there at all timetable schedules"

2. What features (if any) of the current MSC space do you like?

"I like how it's less formal than most study spaces, which I think makes it easier to ask for help."

3. In your opinion, how could the current MSC space (not the location) be improved?

"MSC needs to be much bigger and has more tables and chairs. There is always not enough tables and chairs for the students"

"I needed the encouragement and support provided by the MSC. I felt very welcome there and this really helped in my maths"

"The staff were more than friendly and very helpful. I would have failed two of my modules without the MSC."

"More seats and space to work. 5 people around a small table doesn't give space to work comfortably."

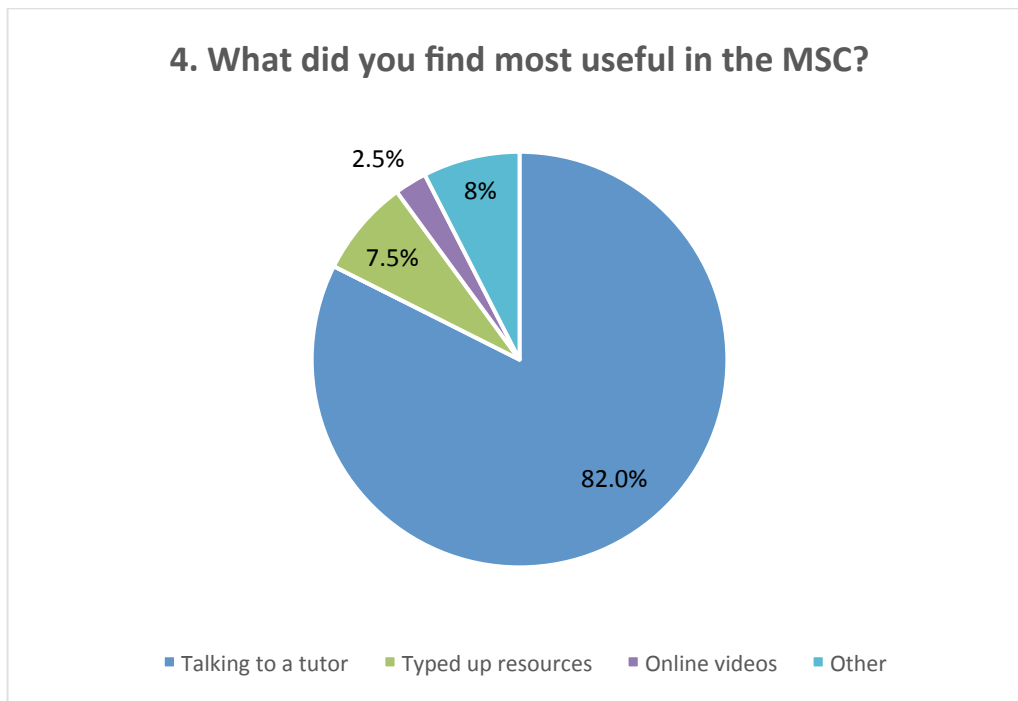


Figure 6: What did you find most useful in the MSC?

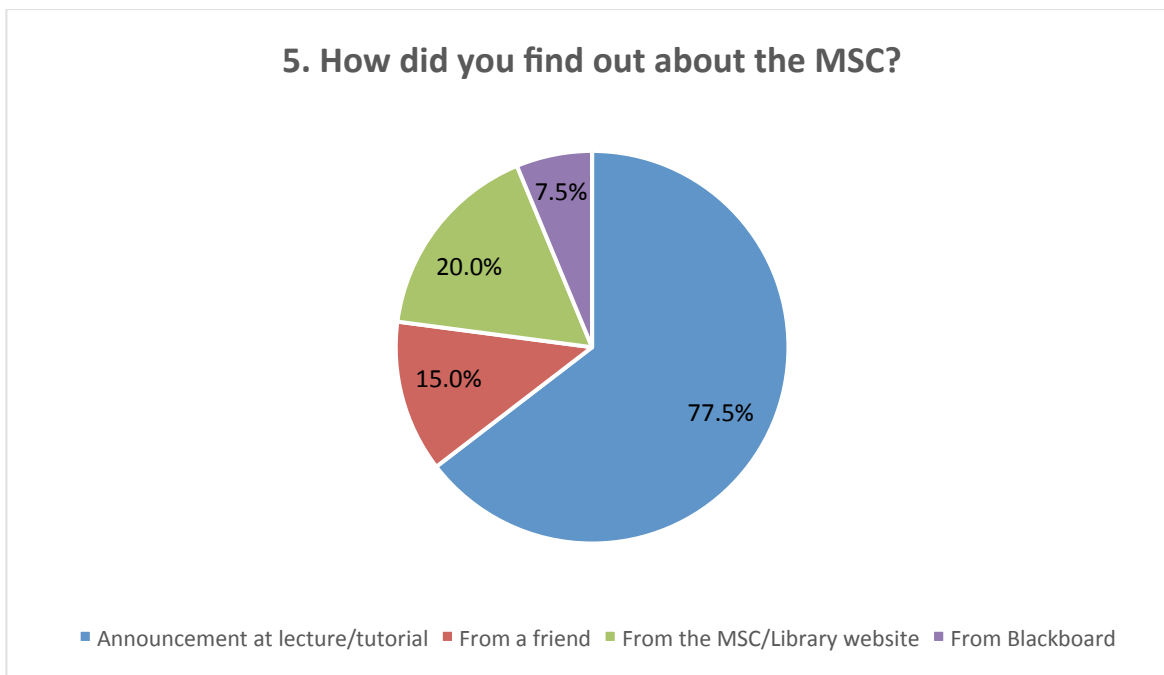


Figure 7: How did you find out about the MSC?

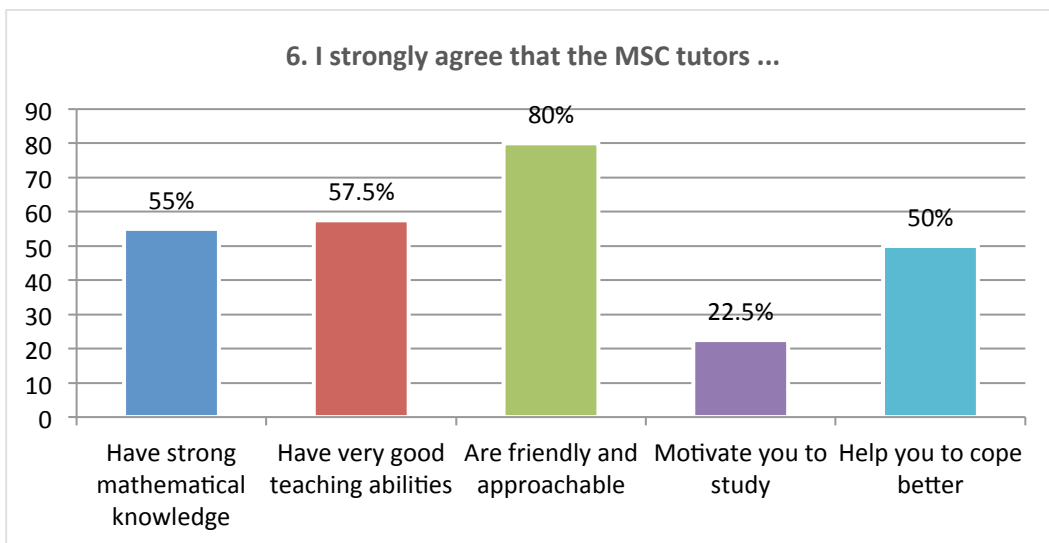


Figure 8: I strongly agree that the MSC tutors ...

7. I feel more confident as a result of visiting the MSC

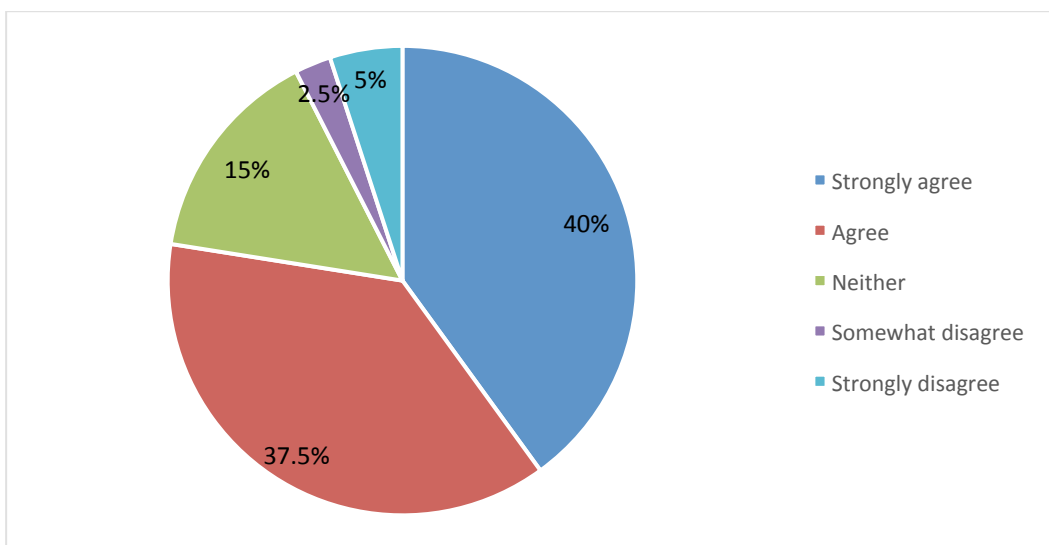


Figure 9: I feel more confident as a result of visiting the MSC

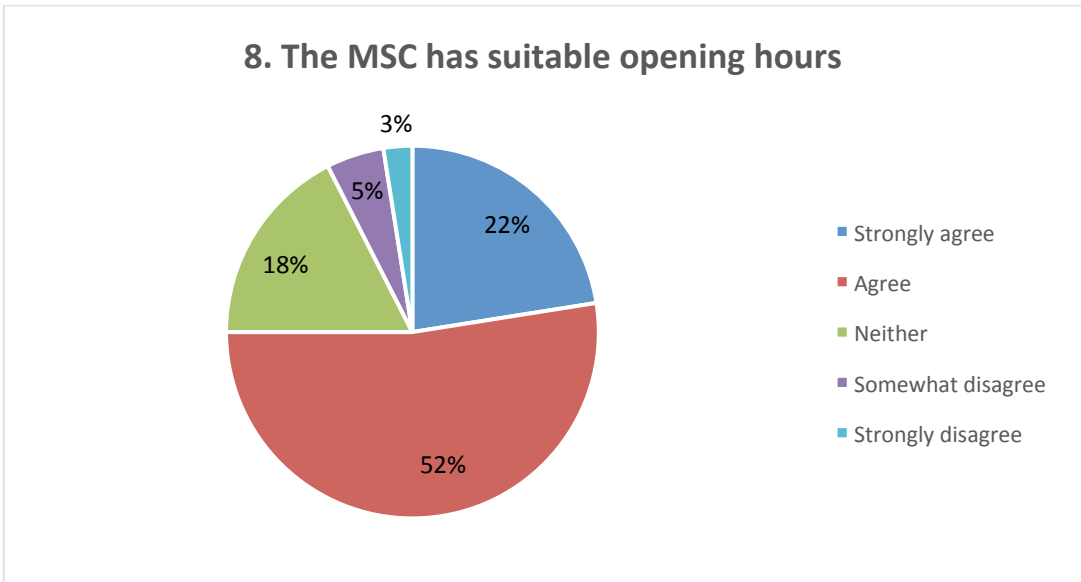


Figure 10: The MSC has suitable opening hours

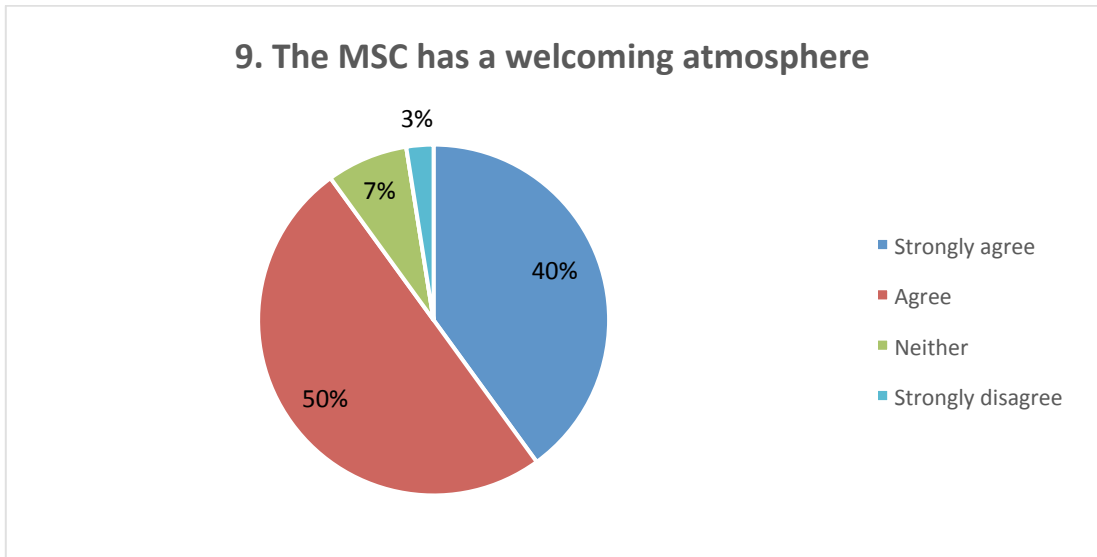


Figure 11: The MSC has suitable opening hours

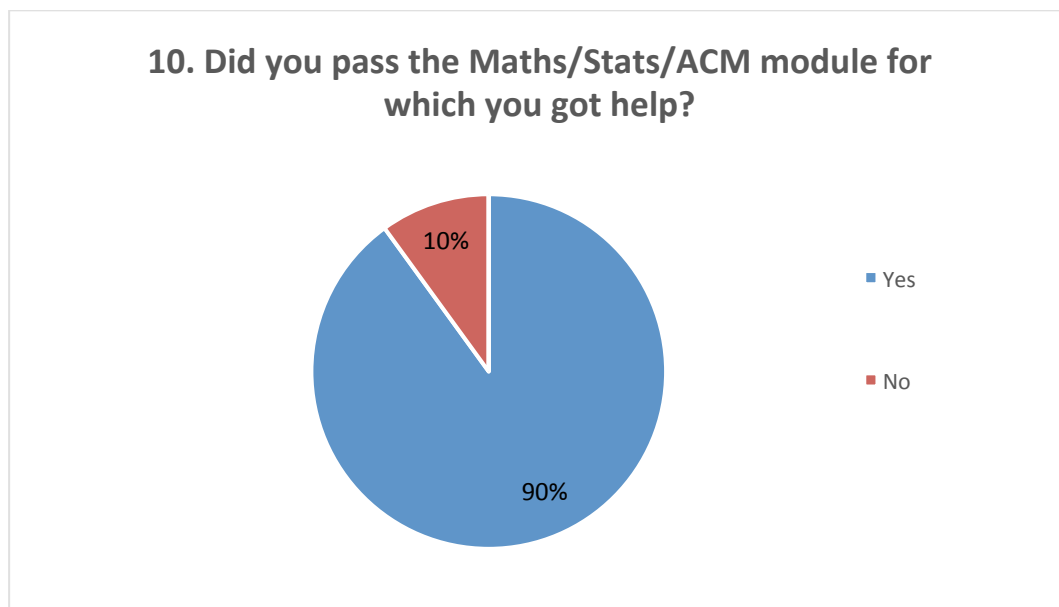


Figure 12: Did you pass the module for which you got help?

Staff Testimonial

“The Maths Support Centre has become part and parcel of the *Access to Science and Engineering* student experience. Our diverse cohort of adult learners are particularly well served by the Centre, which plays a key role in providing support and reassurance as the students get to grips with the material, and make the transition into self-directed learning. Depending on their particular circumstances, our students benefit from one-to-one or group learning in the Centre, and continually report that the tutors are excellent at what they do, and are patient and generous with their time.”

Thomond Coogan - Access Co-ordinator
Adult Education Centre, UCD Access and Lifelong Learning

Student Testimonial

“Dear Anthony,

Recently we had a chat with the guys about the Maths Help centre. We all agreed on the following. Without the Maths Help Centre we would struggle big time and our grades would be definitely worse.

I would like to thanks [sic] for all your help and please make sure that the staff knows that their hard work is highly appreciated.”

Szabolcs Lakatos – 2nd year Engineering student

Welcoming Atmosphere

The welcoming atmosphere of the MSC is a critical factor in encouraging students to attend. Students may often be quite nervous coming in for the first time. As shown, collectively 90% of respondents agreed or strongly agreed that the MSC has a welcoming atmosphere. This excelled previous year's values by 3%. However this welcoming atmosphere does not just happen. It is the result of the careful recruitment and training of the MSC tutors. Tutors in the MSC must not alone be mathematicians but also have the social skills to relate well with students and their tutor colleagues. They need the gift of making mathematics appear manageable and demonstrate a love for the subject.

"I found the MSC to be welcoming and helpful and I never ever felt like I was being judged. I was so glad I sought help when I got confused. I will definitely use this service again in the future when needs be"

Group Learning

The tutors try to encourage small groups of students to work together. If students from the same module come in to the MSC they are, if possible, taken together and then encouraged to remain and work with each other in solving further problems. It was hoped that they would continue this group work outside the MSC. At 63% agreeing or strongly agreeing that the MSC encourages teamwork the number is a substantial increase on previous year's value of 56%. The move to the James Joyce Library has we believe contributed to this. Many students working in the library came in to the MSC in groups of three or four when they came upon areas in their study in which they needed clarification.

"I have used the MSC over the past two years in college. It was of enormous benefit to me. Not only did I pass the modules I had sought help with, I got good grades in them and actually began to enjoy doing the maths involved. The staff at the MSC are extremely helpful and patient ... the MSC is an amazing service."

Our Hot Topic sessions were an effective method to increase group participation. In particular they encourage the weaker students who may have come to the MSC for the first time, to come back afterwards often in groups of three or four.

Study Groups

In conjunction with the UCD MathSoc auditor the MSC manager arranged for MathSoc members to use the MSC space to form study groups. Research conducted by an M.Sc. student Emma Howard in 2013/14 under the supervision of the MSC director Dr Maria Meehan illustrated the importance of study groups to first year Calculus students making the transition from second level maths to third level maths. The MSC is always keen to promote groups of students to drop in and receive help with their maths in a collaborative setting.

The Venue

The venue is a critical factor for both students and tutors alike. Many students remarked on how pleasant the area in the library was when they came in for the first time. Students in the evaluation stated waiting times were often very long. This was especially true coming up to study weeks and exam time. In these circumstances it can be very claustrophobic and difficult for students to study on their own while awaiting the assistance of a tutor.

Another aspect which is limited sometimes during examination periods, by the size of the room is that a number of students express the wish to remain in the MSC after a session to carry on with their study and have guidance as needed. It is critically important that the room size be maintained or increased in any forthcoming move to new premises.

One worrying feature of the current MSC space within the Library Link is the lack of ventilation and natural light. This leads to tiredness and unhelpful presence of stale air among both students and MSC staff. Improving this issue must be a priority for the next academic term.

“It really is such a useful place to have, especially since you do not have to book a session, you can just drop in. The tutors are very helpful. Sometimes I felt another tutor would have been good as it could get very busy at times and if you don't have long in between classes, you might not get anything done. That is my only criticism. I will definitely be going again this semester with any difficulties I have”

MSC tutors

The importance of the quality of tutors employed in the MSC cannot be overstated. The comments on the evaluation forms have clearly demonstrated not only the exceptional ability of these tutors to communicate their knowledge but also the encouragement and support given by them to the students attending the MSC. It is also important to note that if these tutors are eventually to become lecturers/educators they will have an excellent understanding of the problems experienced by undergraduate students.

But what of the benefits the tutors might gain by tutoring in the MSC? Naturally the most obvious benefit is that it helps support PhD students financially. The second benefit is that the tutors retain a grounding in their basic mathematics. Thirdly, it increases their problem solving skills as they must answer in realtime any query a student may produce. Fourthly, working in the MSC develops their multi-tasking ability as they must be able to rapidly change topic as they move from one student's problem to the next. Lastly they develop the capacity to work as a team. The final three benefits are regarded as key transferable skills in any job application. A number of our tutors have told us that their new employer regarded their work in the MSC as a significant element in achieving their present positions.

The Manager would like to thank all the tutors for their dedicated work often under difficult circumstances. The MSC employed 23 tutors in 2013/2014.

"Brilliant, I would not have passed without the MSC. Teachers are helpful"

"Friendly, open atmosphere with staff who are extremely knowledgeable in most areas of maths. Couldn't recommend it more."

"I just want to say thanks to you and the maths support centre tutors for all the help and support that I received in my year at UCD. The centre is a wonderful support and I certainly would have been lost without it. Thanks again. "

Students' MSC user experience feedback

"The MSC is a fundamental facet of UCD student life for many students from all backgrounds and should stay that way. Considering the vast range of topics thrown at the MSC everyday from different disciplines they cope very well with the resources they have"

"Its an accessible, friendly environment to work in, with several tutors on hand to give you the help you need. In the MSC there is no such thing as a stupid question. "

"The MSC is extremely useful! It is comforting to know that there is an extra area of help outside of lectures and timetabled tutorials, to teach and guide you with your mathematics. At the MSC, you can ask and query exactly what is confusing you and can get the clarification you need. The staff in the MSC are very helpful and help you to learn where you are going wrong with your maths. The MSC is an extremely valuable resource! "

"It was a pleasant experience, the tutors all know what they are talking about and they know how to explain it to you in simple terms so it is understandable. Sometimes the language used in the lectures is difficult to understand but once it is approached in a different way it can be a lot simpler than it seems at first, which is what I found most helpful from the MSC. "

"Teaches you the basics before diving into tough maths "

"Very helpful when coming up to exams to figure out any problems I had trying to revise myself. It's a very stressful time and the support centre helped with this enormously. "

"If I had not used the MSC last smester I would not be confident enough to be studying Engineering Maths now. They have instilled a belief in myself and I find myself looking forward to their help again this semester. They are very cordial, approachable and their knowledge of Mathematics is not only astounding but inspirational"

Students' MSC user experience feedback

"The MSC is a great place. The Staff are incredibly friendly and helpful. They are encouraging and very patient. I passed 2 of my modules in the previous semester thanks to the MSC. (Structural Engineering and Architecture) "

"Very helpful especially hot topic sessions.

It a really good environment to work in. The staff are really helpful and supportive. It was really beneficial when there was hot topics on for the module I was doing."

"After the help i received in the MSC i felt confident in approaching my exam sample questions and no problem returning to ask further questions. "

"MSC is really under staffed, sometimes you have to wait for more than an hour before someone can help you and often you don't have an hour. MSC though really friendly and don't mind that you don't understand and try to help you as best as they can."

"The set-up is good. I think that often students present in the centre can help one-another so seating students studying the same topic can be an efficient way of teaching when the centre is full. "

Conclusions

The quality of service provided by the MSC was formally evaluated in 2013/2014. Each student who attended in semester 1 was emailed and asked to complete the MSC evaluation survey. The number of returns was 399 (48% response rate). The results were very positive.

Students show an extremely high level of satisfaction with the services provided but have expressed dissatisfaction with the provision of a sufficient number of tutors.

Attendance at the MSC (5,721 visits) has increased by 20.44% in 2013/2014 compared to 2012/2013. Average time spent by a student increased once again. If these upward trends in waiting time continue they will most likely have a negative impact on services provided by the MSC.

The change in location to the Library Link in the James Joyce Library has been a positive move. After the MSC re-location to the library not only did we observe an increase in numbers attending but we also noted an increase in attendance by students studying modules other than those with an ACM/MATH/MST/STAT code. These non-mathematical modules represented 21% of the total number of visits .

The Library has agreed to extend our occupation of the Library Link, for our core hours of drop-in, for a further year. A six month review of this agreement took place in January 2014 and it was agreed that the existing partnership continue for the midterm future. Hot Topics if necessary will take place elsewhere.

Provision of a suitable permanent venue in a timely manner will be the main restriction to maintaining the professional operation of the MSC and will certainly curtail the further growth of the MSC.

The MSC is currently fulfilling its stated aims.

Recommendations

New MSC Data Management System (DMS)

The existing MSC DMS is experiencing issues due to the unprecedented amount of data that is now being captured. This data is crucial to the MSC being at the forefront of informing best practice in MSC tutoring.

Therefore it is imperative that due investment be made in upgrading this system, so that a secure, robust and accurate recording of data can be achieved.

5 ECTS Peer-Assisted Tutoring (PAT) module

The hiring of undergraduate tutors will be trialled in 2014/2015 with a view to developing a 5 credit ECTS module on PAT, based on MSC practice.

Diversify the range of supports offered

The ability of the MSC to cater not only for the increase in numbers but also the increase in length of individual student visits is now a concern for the Centre.

The increasing length of visit by a student, in particular, where it involves waiting time for a tutor, needs to be addressed. The obvious answer is to provide extra tutors. There is of course a financial restriction to this solution. So a new approach to filling this waiting time needs to be developed. The research to be undertaken by the previous manager should result in a more imaginative way to resolve this problem. For example, the MSC could develop short videos on frequently asked questions that students could study while waiting for a tutor.

Hot Topic sessions are an important approach to fulfilling the learning needs of a large group as opposed to one-on-one teaching. Increasing the number of these sessions early in the semester should be employed to reduce the call on tutors for individual tuition. An unexpected further advantage of these sessions is that students often arrive at the MSC in small groups as a result of working together in the Hot Topic session.