



**UCD Mathematics Support Centre
University College Dublin**

Report on the Academic Year 2008/2009

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Executive Summary

The Mathematics Support Centre (MSC) offers support in mathematics to students throughout all programmes in UCD not just those studying mathematics. This includes students at all levels from Access to PhD students and assists New Era, Mature students and students with disabilities.

Students from 55 out of a total of 81 programmes throughout the University attended the MSC in 2008/2009. This represents 68% of the total undergraduate programmes in UCD. It demonstrates the essential requirement of a good grounding in mathematics for many third level students. Students studying Arts, Agriculture, Commerce, Chemistry, Economics, Engineering, Finance and Actuarial Studies, Geography, Health Sciences, Medicine, Mathematics, Mathematical Physics and Statistics were some of those tutored by the MSC this year.

The MSC assisted New Era by running mathematics revision classes both for New Era students coming into UCD August 2008 and the New Era summer school project for 5th year second level students in June 2009. A number of mature students this year availed of the self-assessment tests put up on the MSC website in September 2008 and came to the MSC subsequently to cover areas in which they found they were weak.

The Manager instigated a targeted publicity drive that resulted in a further increase in the usage of the MSC over the last academic year (Figure 1. Number of visits to the MSC). There were a total of 2300 visits to the MSC in this academic year an increase of 160%.

An extensive evaluation process of the MSC and its staff (the manager and eleven tutors) was carried out in May 2009. (See Section 3 & Appendix 2). The results of this were very encouraging and were highly complimentary of the work of the MSC. This is what one student said, *Really amazing, I dislike maths greatly due to the fact that I have always found it difficult and the thought of doing it at third level was scary.* Respondents' descriptions (Appendix 3) of their experience of using the MSC were very positive with one notable exception and that related to the venue presently occupied by the MSC. As one student wrote, *the only problem was the size of the venue. Sometimes the noise level was disturbing only because the venue is so small. I don't think it's fair to ask Nuala and her team to operate under such cramped conditions, likewise for the students.* The venue is a room in the Mathematical Science building and though centrally located is very restricted in size. A larger area is critical for the MSC to function effectively and the Manager strongly recommends that suitable accommodation be found without delay.

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 but have expressed considerable dissatisfaction with the venue. Continued analysis of pattern of attendance and context of sessions has allowed for more time and cost effective working patterns to be implemented and we expect to develop this further.

We believe that the MSC represents a model of best practice for the provision of support within UCD.

1. Introduction

1.1 Origins of the Mathematics Support Centre (MSC)

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

1.2 Aims of the MSC

The Mathematics Support Centre aims to:

- Provide mathematics support for undergraduate students of all mathematical abilities, on a one-to-one basis, in a friendly, relaxed and informal atmosphere.
- 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.
- Ease the transition of first year students from secondary-level to tertiary-level mathematics.
- Provide targeted mathematics support for Access students, New ERA students, mature students, and students with disabilities.
- Increase the effectiveness of the MSC by evaluating the MSC's activities and communicating and co-operating with other mathematics support centres in Ireland and the UK.

1.3 Services provided

The MSC provides a range of services including:

- Dedicated drop-in centre staffed by friendly and supportive tutors.
- One-to-one tuition or group-tuition as required.
- Supervised study.
- *Hot Topic* tutorials.
- Relevant textbooks and handouts.
- Web-based learning materials.
- Directed link on Blackboard to the MSC.
- Practise sheets covering problem areas for Access and Level One students.
- Computer access to Blackboard

1.4 Staffing

The Director is a member of staff from the UCD School of Mathematical Sciences. A full-time manager currently staffs the MSC. All tutors employed are postgraduate students usually those studying for PhDs in Mathematics, Finance, Mathematical Physics or Statistics. The Manager selects the tutors based on their areas of expertise and their teaching ability (See 3.6 Students' opinions of the MSC staff).

1.5 Opening hours

This academic year the MSC opened on 10th September 2008. A large increase in the number of students attending the MSC the previous year led to a re-evaluation of opening hours. As a result students were encouraged to use the facility purely on a drop-in basis. This practice was continued this year throughout each semester. However an "appointments only" system was introduced outside these times to allow a more cost-effective use of the facility.

The MSC opened four days per week during Semesters 1 and 2 and also the two revision weeks and four assessment weeks. Times of opening during both semesters were adjusted from the previous year as it was found that the 10:00 to 11:00 hour was poorly attended and the previous year's evaluation had indicated that an evening session should be available to evening students or those whose lecture timetable did not allow them attend at normal opening hours:

Monday	11:00 to 13:00 and 14:00 to 17:00
Tuesday	11:00 to 13:00 and 14:00 to 17:00
Wednesday	11:00 to 13:00 and 14:00 to 19:00
Thursday	11:00 to 13:00 and 14:00 to 17:00

Despite the addition of an evening session this year the number disagreeing with the suitability of opening hours increased from 5% in 2007/2008 to 10% in 2008/2009. This will need further investigation to see if it is possible to provide more appropriate times next year.

In addition *Hot Topic* and Revision tutorials had to be held in the evenings due to lack of availability of lecture halls during the day. Numbers attending these tutorials were significant in 2008/2009.

1.6 Record keeping

A database of all students attending the MSC is maintained. At each visit the student fills out an attendance sheet recording his or her name, student number, programme, module for which help is being sought and email address. At the end of the visit the tutor completes this form recording their name, the topic covered and time of arrival and departure of the student and any other pertinent comments.

A copy of the Attendance Form can be found in Appendix 1. It is planned to alter this system next year to reduce the amount of paperwork required.

1.7 Location and physical resources

The MSC was initially set up in a small office on the second floor of the John Henry Newman Building. The location was unsuitable as it was not centrally located or of sufficient size to cater for the numbers attending. In 2007/2008 the MSC was relocated to a pleasant room with a large window situated on the ground floor of the Physics building. However, due to development of the area another room was allocated to the MSC. The size of this room is entirely unsuited to accommodate the increasing numbers attending and has resulted, at times, in standing room only for some students while other more anxious students are disconcerted by the lack of space and only come as far as the door. The question of room size is a major concern for the MSC. Even maintaining the status quo is difficult with this room and it is the major factor in preventing its further development. Lecture rooms are made available in the same building in the evenings when required for larger group tutorials. The Manager also shares an office in the School of Mathematical Sciences and has computer and photocopying facilities there

The MSC has a just one laptop, which has been extensively used by staff and students while working in the MSC.

A number of sheets containing extra sample questions have been drawn up by the tutors and also there are extra notes on areas with which students frequently have problems; for example injective, surjective and bijective functions.

The MSC has greatly increased its library of suitable books on various mathematical topics thanks to gifts from various lecturers. Both tutors and students avail of these while in the MSC.

Leaflets containing the common integration and differentiation functions and other maths physics formulae have proved very popular.

1.8 Publicity

Prior to the Leaving Certificate results being announced in August 2008, the manager spoke to the president of the Institute of Guidance Councillors of Ireland Ailish Coakley. This resulted in a notice being put on their website informing guidance councillors about the services of the MSC. Also all of those answering queries on the Leaving Certificate helpline were informed of the service to allow them to assure students worried about third level mathematics that extra mathematics help would be available in UCD for any student who required it. This year the manager, with the assistance of the student advisers, specifically targeted students attending orientation. These included international students, mature students, students with disabilities and students studying agriculture, commerce, medicine and biomedical science. The students were given information about the assistance provided by the MSC, its location and webpage, and were informed that it was a free service for all undergraduate students in UCD. They were told that students aiming for an “A” grade were frequent visitors as were those struggling to pass.

The MSC in conjunction with New Era ran a week of mathematics revision. These courses were given in August 2008. One course covered revision for Leaving Certificate students Higher Level and another for Ordinary Level.

In order to further publicise the MSC, and in particular for those actually taking mathematics as one of their modules, the Manager (with the agreement and support of the lecturers) visited first year mathematics lectures at the beginning of the semester. The students were told that the MSC did not replace lectures or tutorials but was an extra facility provided for all students to enhance their performance in mathematics and in particular for those finding problems with their mathematical studies. The students were reminded by the lecturers on a regular basis of the benefits of using the MSC. This once again proved to be a highly effective strategy and an important factor in the attendance of students at the MSC. This was confirmed by the number of students (47%) indicating in the Evaluation Form (see Appendix 2: Evaluation Form) that they had heard of the MSC at lectures. Other forms of advertising used were posters, plasma screens, flyers and the MSC website.

The Manager also contacted all the Student Advisers early in both semesters informing them of the new location and opening hours of the MSC.

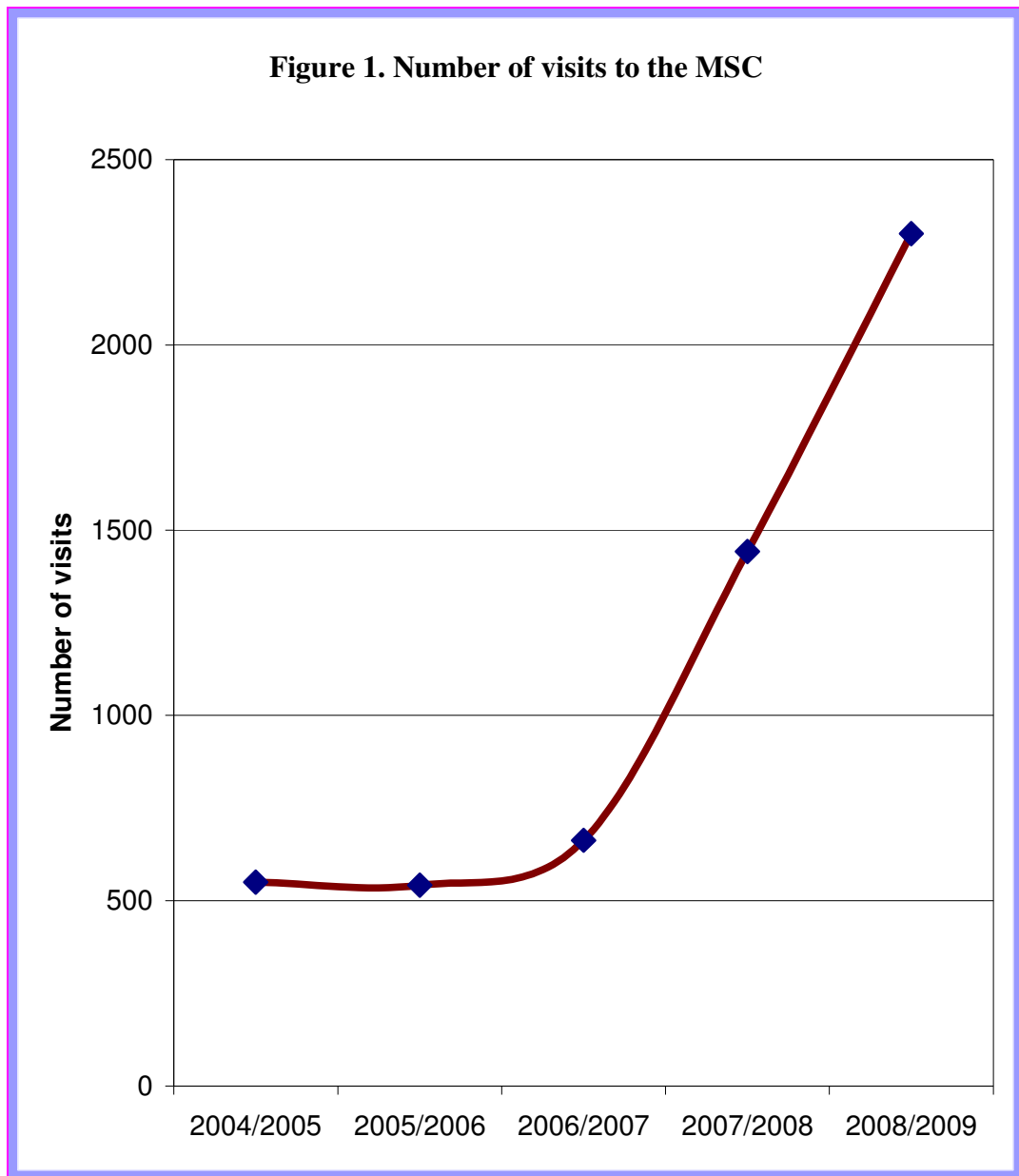
1.9 Funding

The MSC initially received HEA funding for three years. Since September 2007 the MSC is funded by UCD to the tune of €90,000. The majority of this funding pays for the staffing costs of a full-time manager and post-graduate tutors and a small balance goes towards the purchase of computer equipment and extra textbooks?

2. Mathematics Support Centre usage

2.1 Annual visits to the MSC since 2004

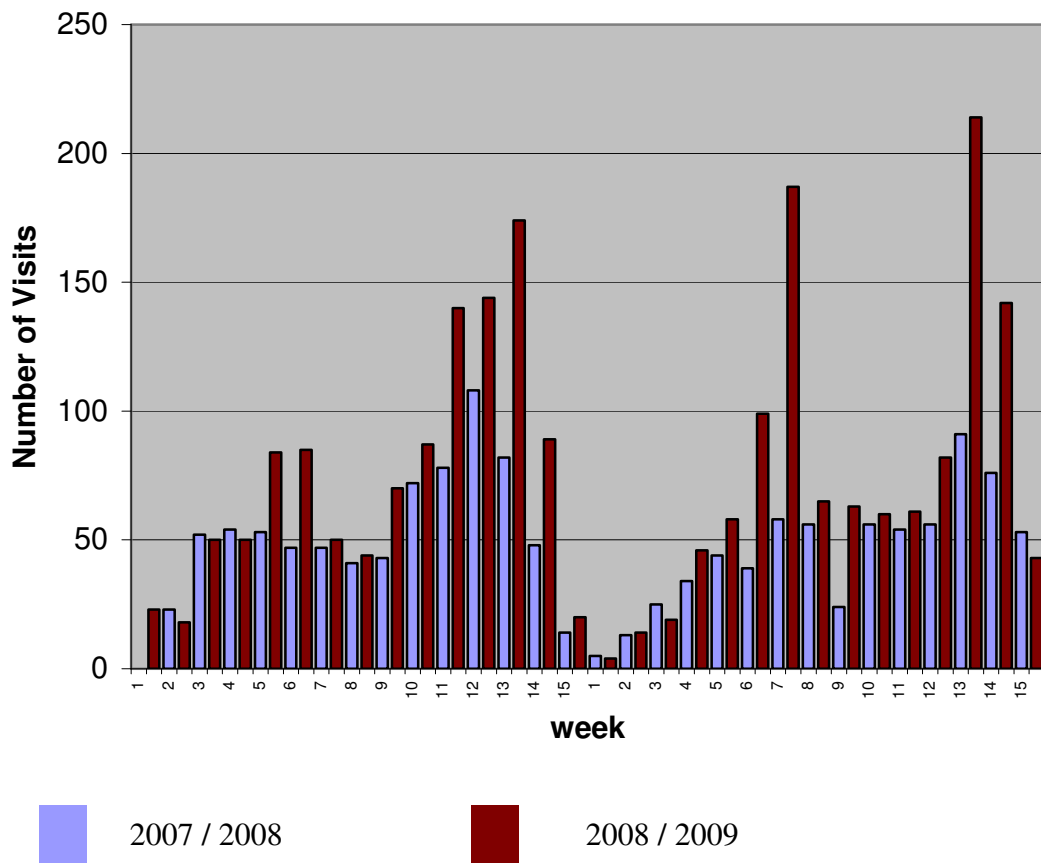
The numbers of visits to the MSC since it opened in 2004 are given below. In 2008/2009 the number of visits to the MSC was 2300 and this is 160% of last year's total which was more than double the previous year (see Figure 1). This put severe pressure on the staff of the MSC to cope because of the confined space in the present facility.



2.2 Weekly visits to the MSC in 2008/2009

The MSC opened officially in the second week in the first semester. This year there were a number of visits to the MSC before it officially opened. This was mainly due to mature students who had difficulty with some self-assessment tests on the MSC website. These were available for the first time this year. The students had been given information on these at their orientation. Otherwise as expected the number of visits was lower at the beginning but increased over the course of the semester. Due no doubt to the fact that students were unaware of their difficulties early on but as the coverage of the module increased and mid-term examinations approached the students realised they needed the extra support. Numbers were again maintained in the second semester. Once again numbers increased as expected near end of semester and particularly in the revision week and the first week of examinations. The number of visits per week for 2007/2008 and 2008/2009 is shown in Figure 2. Semester one & semester two student visits.

Figure 2. Semester one & semester two student visits



2.3 Number of single visits and average time of visits

The total average time spent by a student in the MSC was 71 minutes as compared to 69 minutes last year. The median number of visits during the year by a single student was 1. This could be interpreted as dissatisfaction with the services supplied by the MSC, but is more likely to be explained by the fact that 41% of the students filling the evaluation forms stated their reason for attending was a problem with a specific area. (See paragraph 3.3 Why students first decided to use the MSC). It could also have been partly due to the increased number of Hot Topics and their higher rate of attendance. Hot Topics were normally two hour duration. Possibly many students attending these Hot Topics did not feel the need to seek further help.

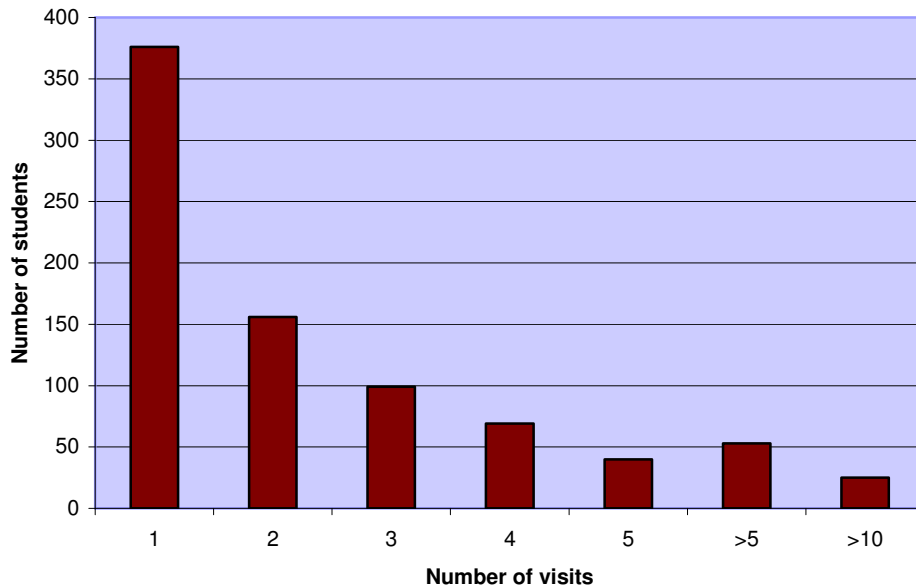
Here is a quote from one student,

Studying Biostats; went to extra tutorial (17:00 - 19:00), organised by the MSC; positively surprised as it was for free,; handout helped a lot I got and A+.

The range in the number of visits by any one student was from 1 – 43 visits.

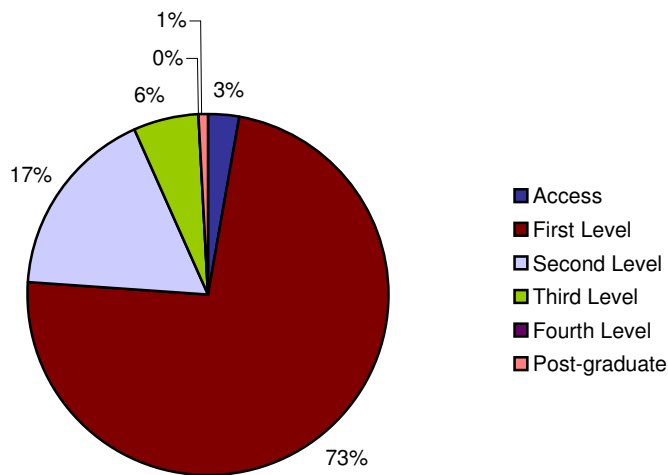
See Fig 3. Number of visits per student.

Figure 3. Number of visits per student



2.4 Percentage numbers of students from various levels

Figure 4. Level of students attending the MSC 2009



Students from first level formed the majority of attendees with 73% of the total number. This has increased from 60% the previous year. All other levels retained the number of students as in the previous year. This indicated that the overall increase in attendance was mainly due to the increase in first level students. Access students made up 3%, once again indicating a high usage of the MSC compared to overall student proportion of these students. It is worth noting that nineteen postgraduate students attended the MSC. Figure 3 above gives the percentage numbers from each level attending the MSC in the 2008/2009 academic year.

2.5 Equality of opportunity

The close co-operation between the Student Advisers and the MSC has been very effective. In addition the Manager liaised with the New Era Programme. The following were some of the comments by the students on the advantages of mathematics revision course run in their first week of orientation.

The tutors kind of know you and you know them – you're not afraid to go to the MSC for help.

Yes because it revised all the basics and I won't be struggling with these now.

It helped to gain confidence in the subject.

The manager spoke to the Mature students at Orientation informing them of the MSC facility and advising them of self-assessment tests on the MSC website

which were designed to help them revise their mathematics. A number of mature students subsequently came to the MSC to follow up on these tests. It is worth noting that 21% of those who answered the evaluation forms this year indicated they were mature students as compared to 17% last year. Further help for mature students is planned for next year. In light of the current recession the number of mature students may rise and the support given by the MSC could be a critical factor in their completion to degree level.

Students with disabilities were also given an information briefing at their orientation.

In June 2009 the MSC also conducted 5th year Leaving Certificate mathematics classes for the New Era Summer school and a lot of excitement was generated when they were given the chance to apply their mathematical knowledge to the problem of designing a mathematical function to represent “A perfect father’s day”. One4all had sponsored the competition and the two young people who won had shown an exceptional understanding of the possible applications of various mathematical functions.

2.6 Programmes using the MSC

Students from 55 out of a total of 81 programmes throughout the University attended the MSC in 2008/2009. It represents 68% of the total undergraduate programmes in UCD. This demonstrates the essential requirement of a good grounding in mathematics for many third level students. Students studying Arts, Agriculture, Commerce, Chemistry, Economics, Engineering, Finance and Actuarial Studies, Geography, Health Sciences, Medicine, Mathematics, Mathematical Physics and Statistics were some of those tutored by the MSC this year.

2.7 Identifying areas of greatest need: developing *Hot Topics*

If lecturers or students identified particular areas in which students were having difficulty, the MSC designed and delivered revision classes in these areas. For example some students requested help with some areas in statistics and the MSC ran three evening sessions covering these topics. Two of these sessions had twenty-five students, as space in the MSC is extremely limited, lecture rooms were booked for these sessions. The Hot Topic sessions in Calculus were particularly well attended.

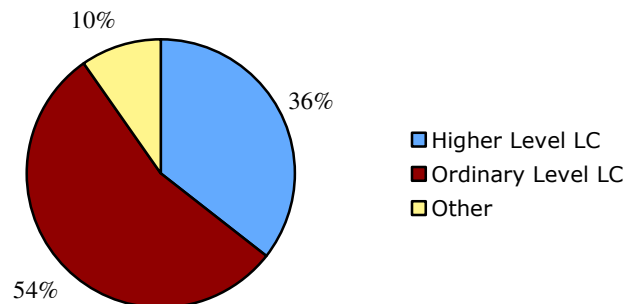
3 Evaluation of quality of service provided by the Mathematics Support Centre

For the first time the MSC Evaluation Form was put on line and students who had attended the MSC 2008/2009 were emailed in April 2009 asking them to fill in this evaluation. (A copy of the MSC Evaluation Form can be found in Appendix 2). However there were a number of teething problems with this which resulted in a small number of areas not being recorded. Two important areas in which this occurred were the comments of the students and whether they would recommend the MSC to a friend. This unfortunately means we lack the full data in these areas. However these problems were resolved and the forms which came later contained this data and will be reported with a note to this effect. The return rate of forms from those who had attended the MSC 2008/2009 was 32% which compared with 29% the previous year. The previous year there was a high rate of response to questionnaires distributed locally at the MSC but a poor return of emailed questionnaires.

3.1 Level of student attainment in mathematics prior to third level

In response to this question 54% of students stated that they had taken the Higher Level Leaving Certificate (LC) in Mathematics, 36% the Ordinary Level LC and the balance were students from GCSE or other qualification examinations. Of those who took the Higher Level LC 16% obtained an “A”, 42% obtained a “B” and 28% a “C” whereas of those who took the Ordinary Level LC, the majority at 52% obtained a “B” with 29% obtaining an “A”. The level of attainment at honours level was significantly higher than the previous year.

Figure 5. Student prior level of mathematical attainment



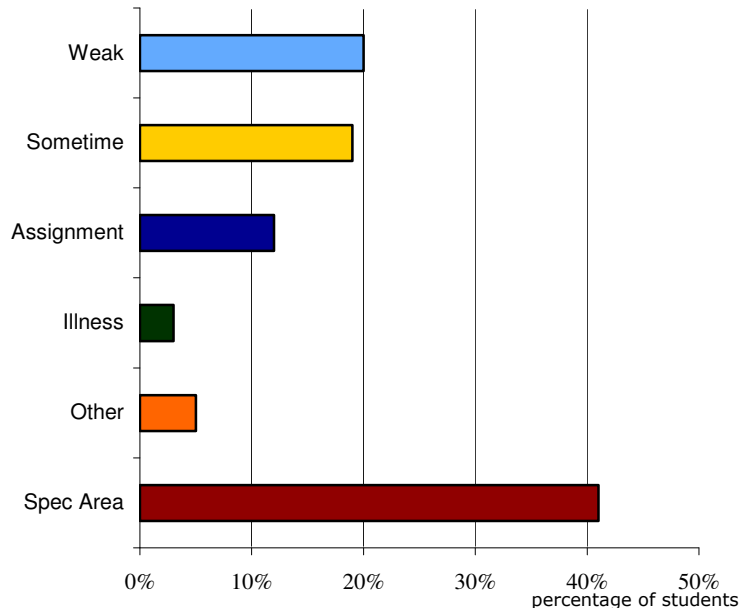
3.2 Knowledge of existence and purpose of the MSC

The students were asked to tick one or more ways in which they had found out about the MSC. Almost 51% indicated that they had heard about the MSC in lectures. The second most effective way at 16% was on the recommendation of a friend. The importance of this second method of advertising the MSC has been further backed up by the answers given to the question asking “Would you recommend the MSC to a friend?” 98% of those whose answers were recorded said “yes”. (Note: teething problems with the on line evaluation form referred to in the introduction to this chapter). The effectiveness of Blackboard, plasma screen and flyers was lower at 8% each and finally the MSC website and other methods were less effective.

3.3 Why students first decided to use the MSC

Respondents were allowed to indicate multiple reasons if applicable. 41% per cent indicated their attendance was motivated by needing help in a specific area; 20% felt their background in mathematics was weak and 19% that it had been a while since they had studied mathematics. 12% indicated that attendance was motivated

Figure 6. Why students first decided to use the MSC



by having a tutorial/assignment/project to hand in. Illness was cited as a reason in 3% of respondents. Once again the majority of the “other” reasons expressed the necessity to study for exams.

3.4 Students' opinions of the MSC

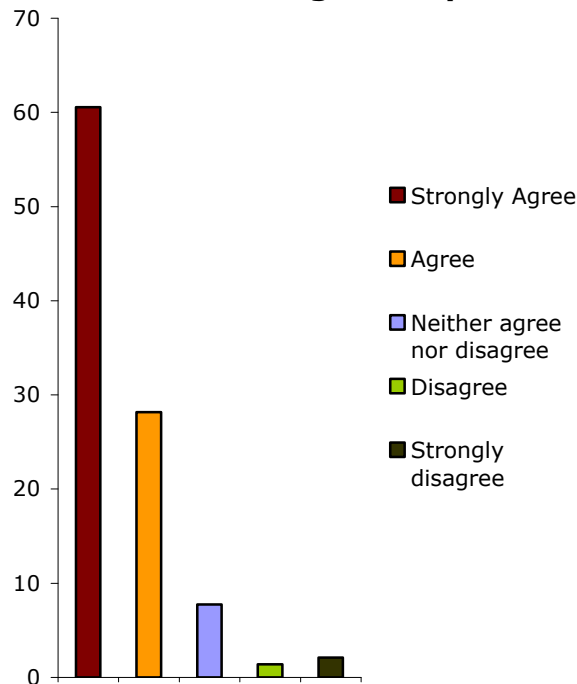
The respondents were asked for their opinions on various aspects of the MSC using a five-point Likert item.

The questions were as follows: Did the MSC

- Have a welcoming atmosphere?
- Have suitable opening hours?
- Encourage students to work with other students in their class?
- Provide a relaxed place to study?

The following charts describe their replies.

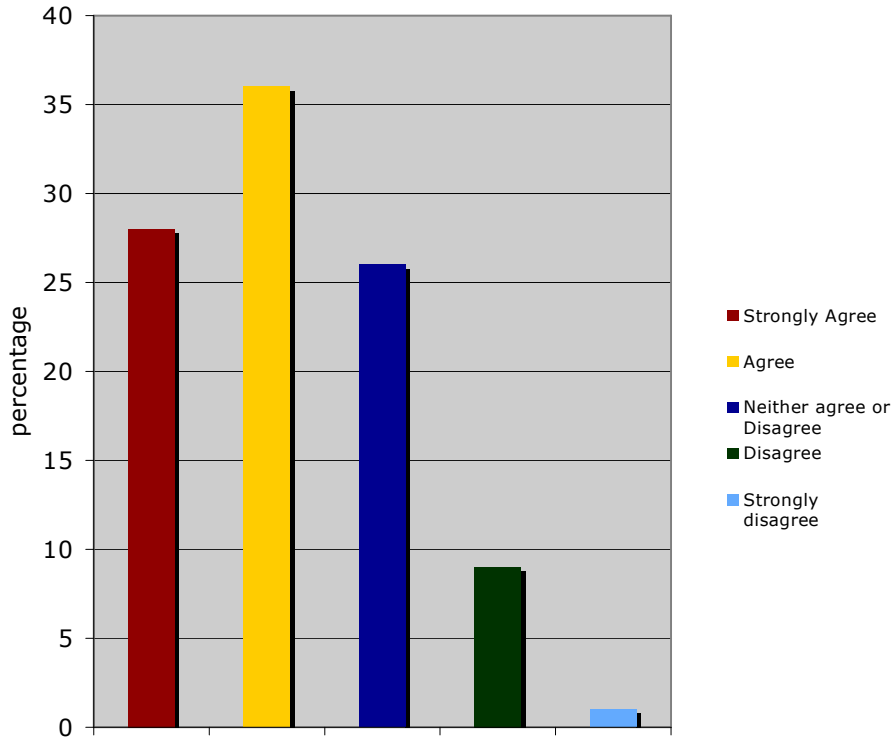
Figure 7. The MSC has a welcoming atmosphere



As shown almost 90% of respondents agreed or strongly agreed that the MSC has a welcoming atmosphere. This is down from 99% last year which is not surprising considering the very difficult circumstances under which the MSC staff had to work. Students were at times intimidated by the crowded room or felt they could not stay on for further study as others were waiting for seats. The welcoming atmosphere of the MSC is a critical factor in encouraging students, who often may be quite nervous, to come in for the first time and also to stay on and work on their own with a little extra support. This is just one student's comment on the atmosphere of the MSC.

The tutors were really good and I never would have understood or passed my module without their help. But the room is tiny and could easily and quickly become very full and cramped which made it harder to get the work done.

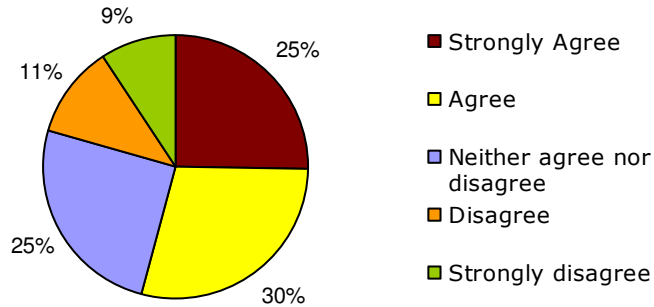
Figure 8. The MSC has suitable opening hours



There was considerably less satisfaction with the opening hours this year than last year where 83.5% of respondents agreed or strongly agreed that the MSC had suitable opening hours. This year only 64% agreed or strongly agreed that the MSC had suitable opening hours, 26% neither agreed nor disagreed and 10.0% disagreed. The Manager altered the times of opening during the year, by looking at numbers attending various times, as the year progressed. She tried to open for as many suitable hours as possible and opened once a week in the evening for the first time. However the problem perhaps is being seen as a problem with opening hours when the true problem may be the capacity of the venue as a number of students have turned away when the room is full.

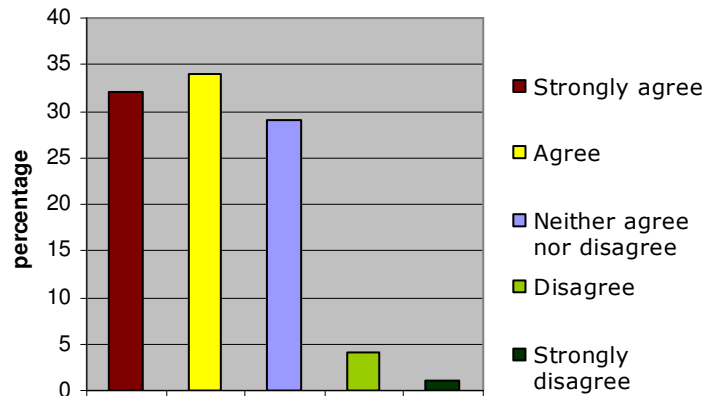
However, as it stands budget restrictions and the capacity of the room did mean that the MSC could not satisfy all needs. Without a considerable increase in funds or preferably a larger room we cannot hope to provide enough hours for our ever increasing numbers.

Figure 9. The MSC encourages teamwork



The tutors tried to encourage small groups of students to work together. If students from the same module came in to the MSC they would, if possible, be taken together and then encouraged to work with each other in the MSC to solve further problems. It was hoped that they would continue this group work outside the MSC. Once again this year these numbers are slightly down and this is no doubt largely due to availability of space in the MSC this year to allow for our ideal of group work with guidance from the tutors. There were still a small number of groups returning to the MSC together for their next session.

Figure 10: The MSC is a relaxed place to study



Teaching in the MSC is difficult due to background noise from multiple simultaneous teaching sessions. Often students like to continue their work and

have guidance when needed but this was rarely possible this year due to lack of space. Despite these environmental restrictions, though well down on last year's value of 89%, 66% agreed or strongly agreed that it was a relaxed place to study. Indeed many students expressed the wish to remain in the MSC after a session to carry on with their study. However due to the limited space available this was not always possible. This is what one student said, *The only problem was the size of the venue. Sometimes the noise level was disturbing only because the venue is so small. I don't think it's fair to ask Nuala and her team to operate under such cramped conditions, likewise for the students.*

3.5 Had the student passed the module for which they sought help

The percentage pass rate of 94% was slightly up on last year's rate of 92%. But a number of students also commented on the fact that it was not just a question of passing their modules but doing exceptionally well. The following is a quote from one student. *I did two modules in Maths. Calculus and Matrices and Vectors in Semester 1. I got an "A" in both modules. The Maths Support Centre was like a lifeline to me and when I was studying for my exams I stayed within a short walking distance from them. I don't believe I would have achieved the grades I got without their help.*

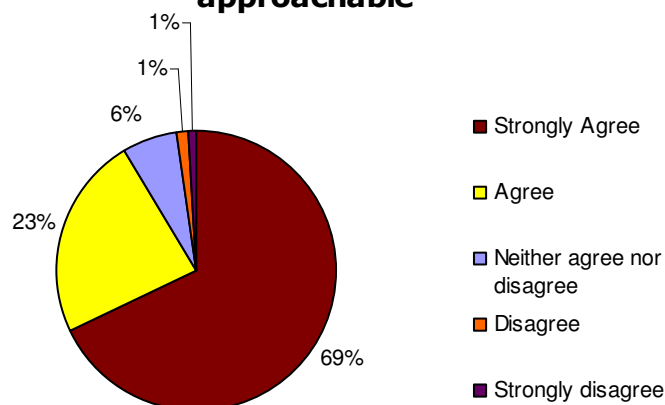
3.6 Students' opinions of the MSC staff

The respondents were asked for their opinions on various aspects of the MSC Staff again using a five-point Likert item. The questions asked about the MSC staff were as follows

- Are they friendly and approachable?
- Have they good teaching abilities?
- Have they a good knowledge of mathematics?
- Do they help you to cope better?
- Do they motivate you to study?

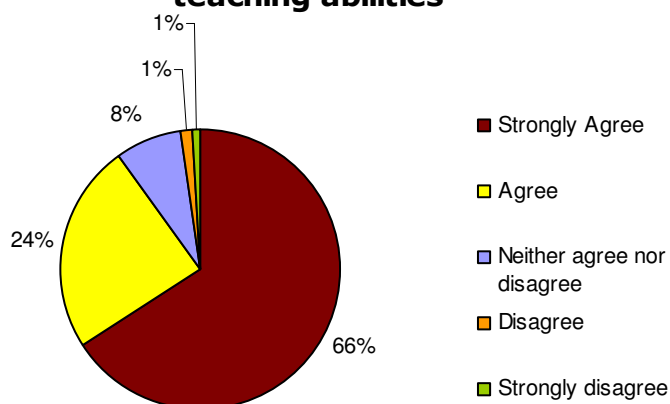
The importance of the quality of tutors employed in the MSC cannot be over rated. The comments on the Evaluation forms have clearly demonstrated not only the exceptionally high level of teaching but also the encouragement and support given to the students by the MSC tutors. The MSC employed eleven tutors this year. They were Ger Boland, Cormac Breen, Alex Byrne, Judith Delaney, Sean Delaney, Ronan Flatley, Ian Harris, Anna Heffernan, Thomas Jaeck, Jonathan Mackey and Susan O'Carroll.

Figure 11. Staff are friendly and approachable



The attitude of the staff to students coming in to the MSC is very important as often those coming in for the first time are quite anxious. It is essential that they feel that they can approach the staff and not feel intimidated. The tutors are well aware of this and encourage the students to relax and explain where they are having problems. Quoting one student, *Very, very helpful and friendly. Helped with some chemistry problems I had as well as with Maths. I don't think I'd have passed my calculus without their help.*

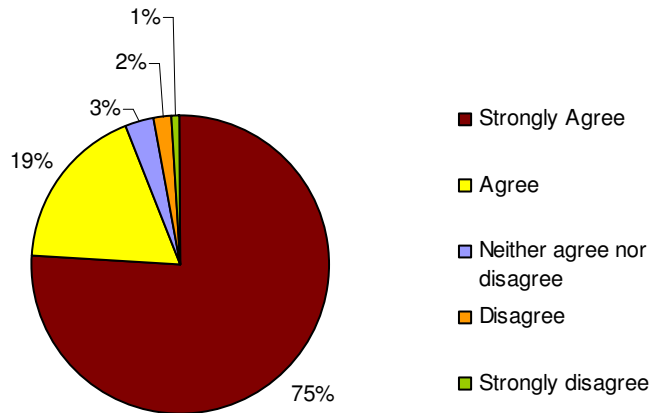
Figure 12. The MSC staff have good teaching abilities



The Manager selects the tutors based on their areas of expertise and their teaching ability. The fact that 90% of the respondents agreed or strongly agreed that the MSC staff have

good teaching abilities, was very encouraging. This is a quote from one student *Really amazing, I dislike maths greatly due to the fact that I have always found it difficult and the thought of doing it at third level was scary. The support centre got me through maths and helped me to achieve the grade I needed.*

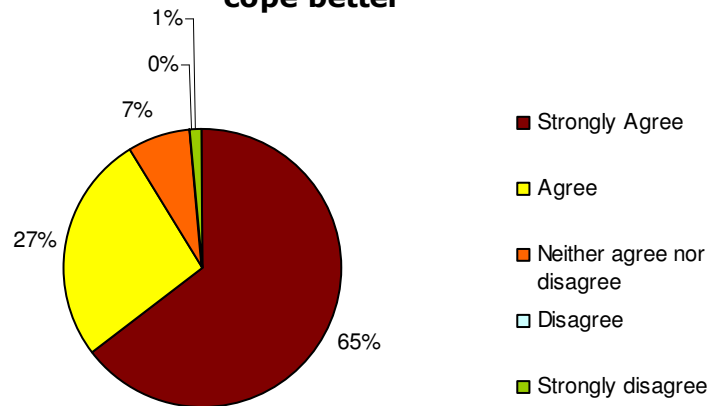
Figure 13. The MSC staff have a good knowledge of mathematics



The staff are involved in studying various mathematical areas and the more advanced students are encouraged to come at specified times if they need help in these areas. 94% of the respondents agreed or strongly agreed that the staff had a good knowledge of mathematics. Quoting from a respondent, *I found the msc to be extremely helpful, really worthwhile and I have never left the msc with the problem I went in with unsolved! Going there really boosted my knowledge and understanding of maths and also my grades. the staff are very helpful and have great knowledge.*

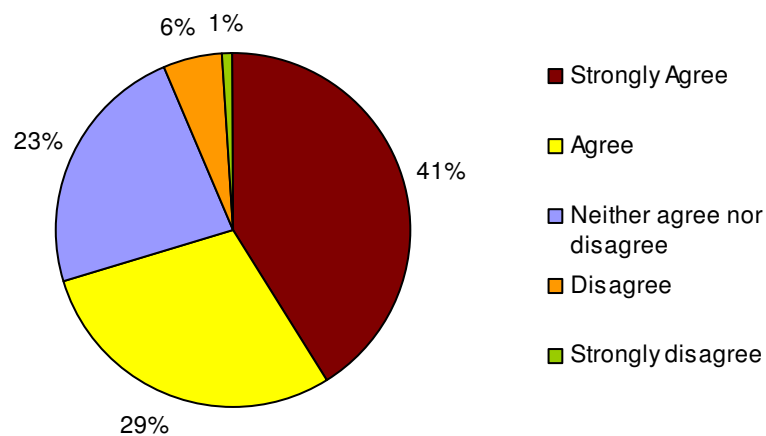
However the MSC is set up to help undergraduates with mathematical problems. This year 19 postgraduate students came to the MSC. The majority of these were looking for help with statistics and certainly for those who had forgotten their basic statistics we were able to help them with their revision. The large majority of the postgraduates appreciated the assistance they received. Here is a quote from one PhD student *I found the staff very friendly and willing. They reassured me and put me at ease about my issues (in my case stats for my Phd). Nuala is a very nice and eager to help and took a lot of time to attempt sort out my issue, and put me in contact with Jason Wyse (School of Mathematical Sciences) who had a stats background. Jason was able to produce the stats results I needed to support my research and enabled me to successfully complete my PhD.*

Figure 14. The MSC staff help you to cope better



From the above diagram it can be seen that 92% of respondents agreed or strongly agreed that the MSC helped them cope better. One particular student among many describing their positive experience of using the MSC stated as follows: *The tutors were really good and I never would have understood or passed my module without their help.*

Figure 15. The MSC staff motivate you to study



A decrease on last years numbers 70% of respondents (85% previous year) agreed or strongly agreed that it motivated them to study. This may have been partly due

to the fact that in the previous year the room was larger, the numbers attending were less and students could remain on in the MSC to study. Some comments from the previous year indicated they were more comfortable studying in the MSC than the library. But in the words of at least one student this year: *I found MSC really welcoming, helpful and motivating.*

3.7 Students' descriptions of their experience of using the MSC

The Mathematics Support Centre (MSC) has a crucial role to play in enhancing students' knowledge of mathematics and in supporting those students who are having problems associated with mathematics. This is confirmed by the comments given by the students in the evaluation forms completed. To give some indication of these we have categorised the comments under headings as given below. The comments were, on the whole, very positive, (See Appendix 3 for all comments). It should be noted however that the replies, given for the section in the evaluation form that allowed students to give their own comments on using the MSC approximately 50%, were not recorded due to the teething problems with the on line form as referred to in the introduction to Chapter 3

1. **Importance:** The importance of having extra mathematics support has been described by one student as follows:

The maths support centre has been incredibly important to me over the last two years. As an engineering student, maths is a core aspect of the majority of my modules, and so the MSC is vital for me. I have availed of this resource on numerous occasions and I am very grateful for all the work Nuala and all the tutors have given me. It is a warm, friendly and inviting place and all the tutors have a very high level of maths. The love they have for it is inspiring and encouraging. As this service is very important to so many people, I think that the college should do their utmost to aid the MSC in all it does, ensuring the ratio of tutors to students is adequate, and providing enough room for the masses of people that are usually there! (especially coming up to exams!)

2. **Professional and confidential:** Confidentiality is an important aspect of the work of the MSC. A number of comments have referred to the professional nature of the staff. Here are comments from two students.

I found the MCS very helpful through all my course. I found the staff were very professional and friendly. I really want to thanks all the staff of the MCS for their support on my Access course to Science and Engineering 2008 - 2009.

MSC is nothing to be ashamed about. The're not going to tell your lecturer, your college mates won't know unless they are there too. It's a great way to learn if you have missed a lecture or have just sat in a lecture not understanding a single thing a lecturer says. The people don't judge you if you don't know basic maths, they support you with all their might.

- 3. Gave student confidence:** Students coming to UCD are very able but sometimes they lack confidence in their own abilities. But as they begin to understand their confidence grows and their stress is reduced. This is what some students said.

I found MSC really welcoming, helpful and motivating. MSC staff are extremely helpful and understanding, and they don't make you feel like an idiot if you don't know something (like my maths teacher in school did if you didn't know the answer!). Thanks for your help and keep up the good work!

Having always struggled with maths at secondary school, I was worried about having to study it on access course. However I was told about maths centre and found the staff very helpful if I had any trouble with certain topics. They ensured you fully understood.

*I did two modules in Maths. Calculus and Matrices and Vectors in Semester 1. I got an "A" in both modules
The Maths Support Centre was like a lifeline to me and when I was studying for my exams I stayed within a short walking distance from them. I don't believe I would have achieved the grades I got without their help especially Nuala who never made me feel silly about any question I asked her. In my opinion it is a vital service to all Maths students as tutorial sessions are too short and infrequent and you can drop in any time to suit your own timetable. Long may it continue.*

I found it very helpful as I am not normally the type of person to go and ask for help about maths, I always try to do everything myself and so when I was struggling with my subject I was very worked up about it and the help I received at the MSC was brilliant.

- 4. Encourages student to ask for help:** Students are often shy about looking for help. It is important that the MSC is seen as somewhere you can always go no matter what your standard.

A fantastic support you can ask the questions you cannot ask in a lecture. You can be helped in the area you are weak in. The Centre always makes you feel good about looking for help. Having this resource gives you confidence in taking on further Maths Modules, which I have done Math10030 and Math10060 to support my economic studies.

The tutors were extremely helpful and approachable. I would definitely recommend it to others. The fact that the tutors were able to break down certain topics for me really helped in my

understanding of certain maths modules. If necessary I will make use of the centre again.

- 5. Students learnt to help themselves:** It is essential that the students do not regard the MSC as a place where they can come to avoid doing the work themselves. The students coming to the MSC should get a good basic understanding of the topic and must be encouraged to develop this understanding further by working on their own and if necessary coming back to the MSC with any further problems.

Very helpful, the tutors were not familiar with the topic I needed help with but had the resources to research and together we figured it out. I thought that way of teaching was very effective. The staff seemed to go out of their way to help. Very positive environment.

- 6. Motivated the students to study:** Sometimes a student may feel that either there is so much to learn that they don't know where to start or else get lost in a specific area. Coming to the MSC will often give them the wherewithal to move on with their study.

I had a very pleasant experience with a lovely lady tutor. She was very knowledgeable and helped me understand the basic concept in my statistics class so it was easy then for me to understand what came next in the class. I will be popping in again this semester no doubt!

I popped in, was pointed to a seat by friendly person, asked question, which was promptly and effectively gone over with me. Presto! Problem understood.

- 7. Increased retention of students:** first year students often need that extra help with basic mathematics that they may have either forgotten or never understood. Once they get this basis they can build on it to a higher level.

Without the help of the fantastic staff at the MSC I would have been significantly less successful in my microeconomics exam last semester, and I feel that if this service was not available I would be much less likely to continue with Economics to degree level. THANKS GUYS!!

- 8. Negative Comments:** There were a few less positive comments. The manager has taken on board these comments and will try to implement even better practice in the MSC as a result. However the vast majority of negative comments emphasized the confined nature of the venue. Unless

this problem is resolved the MSC cannot operate at the high professional level it does now and certainly cannot extend its services to any more students. These are some of the students' comments.

Nuala and her team are excellent. The only problem was the size of the venue. Sometimes the noise level was disturbing only because the venue is so small. I don't think it's fair to ask Nuala and her team to operate under such cramped conditions. Likewise for the students.

I know that some of my fellow students attended the MSC because I told them how good the support is. Please just allocate a larger room.

I would have passed all three modules if the MSC had better resources = more room, more tutors. I often arrived to find a lot of other students waiting for help, and could not get the help I sought. (Passed two out of three)

I wouldn't have passed my statistics module without your help as I have a very poor grasp of maths, but managed to get an a+ in the exam thanks to the support centre. The only thing I feel could be improved is if you got a bigger room somewhere, as the current one can feel a little claustrophobic. thanks again for all your help throughout the year!

4. Conclusions

- Attendance at the MSC has increased by 160% compared to 2007/2008.
- The quality of service provided by the MSC was formally evaluated in 2008/2009 with very positive results. Recommendations from the 2007/2008 report have been implemented other than the question of its location to an appropriate venue. It is essential that UCD give this their urgent attention.
- Students show an extremely high level of satisfaction with the services provided. However they have expressed considerable dissatisfaction with the confined nature of the venue and this will be the main restriction to the further growth of the MSC.
- The MSC is currently fulfilling its stated aims.

5. Recommendations

- Continued analysis of the pattern of student attendance and the mathematical content of the sessions tutored should be employed. This should allow for more time and cost effective working arrangements to be implemented in future years. These arrangements would include the times of employment of tutors and the addition of extra *Hot Topics*.
- A larger venue is critical for the MSC to even maintain the status quo and is the major factor in preventing its further development. UCD should ensure that the MSC be located in an appropriate place to facilitate good working and an optimum environment for learning. A central location with appropriate size of accommodation is essential for the MSC to function effectively.
- Staff should continue to promote and develop the MSC as a centre of excellence.
- Advertising the benefits of the MSC to all relevant bodies is critical for its survival and frequent communication with students, lecturers and student advisors is essential.
- Evaluation of the quality of service provided by the MSC should continue to occur on an annual basis.

Appendix 1 MSC Attendance Form

Maths Support Centre UCD (MSC)

Please complete in BLOCK CAPITALS

TO BE COMPLETED BY STUDENT:

1. **Student's Name:**
2. **Student Number:** **ModuleCode:**
3. **Student's Signature:**
4. **Student Email address:**.....

TO BE COMPLETED BY Tutor

1. **Tutor's Name:**
2. **Day & Date:**
3. **Student Time in:** **Student Time out:**
4. **Topics covered with student:**
.....
.....
.....
.....
.....
.....
.....
.....
.....
5. **Any additional comments:**
.....
.....

Appendix 2 MSC Evaluation Form

Mathematics Support Centre Evaluation Form

1. Student No.: Student Name:.....

2. Are you a mature Student?

3. What was the highest level of maths you studied at school?
What grade did you achieve?

4. Have you used any online resources (eg. Google, Wikipedia etc.) ?
Did you find them helpful?

5. How did you find out about the Maths Support Centre (MSC)?
(Please tick one or more)

- a) Announcement at lectures.
- b) Announcement on the Plasma Screen around UCD.
- c) Flyers.
- d) From a friend.
- e) From the Website.
- f) From Blackboard.
- g) Other (Please explain)

6. Why did you first decide to use the MSC? (Please tick)

- a) Your background in Maths was weak.
- b) It had been a while since you had studied Maths.
- c) You needed help with a specific area.
- d) You needed to catch up on areas missed through illness.
- d) You had a Tutorial/Assignment/Project to hand in.
- e) Other (please explain)

7. Did you pass the maths module for which you sought help?

8. Please circle as appropriate.

The MSC ...

has a welcoming atmosphere?

Strongly disagree 1 2 3 4 5 *Strongly agree*

has suitable opening hours?

Strongly disagree 1 2 3 4 5 *Strongly agree*

Please turn over

is a relaxed place to study?
Strongly disagree 1 2 3 4 5 *Strongly agree*

encouraged me to work with other students in my class?
Strongly disagree 1 2 3 4 5 *Strongly agree*

9. Please circle as appropriate.

The MSC staff ...

are friendly and approachable?
Strongly disagree 1 2 3 4 5 *Strongly agree*

have good teaching abilities?
Strongly disagree 1 2 3 4 5 *Strongly agree*

have a good knowledge of Mathematics?
Strongly disagree 1 2 3 4 5 *Strongly agree*

help you to cope better?
Strongly disagree 1 2 3 4 5 *Strongly agree*

motivate you to study?
Strongly disagree 1 2 3 4 5 *Strongly agree*

10. Would you recommend the MSC to a friend?

11. In your own words describe your experience of using the MSC.

I consent to this form being confidentially stored and used for research purposes.

Signed: Date: ____/____/____

Appendix 3 Students' descriptions of their experiences using the MSC

The following are a copy of all the comments on the evaluation forms, in no particular order, sent in by students attending the MSC. Once again it should be realised that due to the problem with the initial on line form sadly many other comments were not recorded.

The maths support centre has been incredibly important to me over the last two years. As an engineering student, maths is a core aspect of the majority of my modules, and so the MSC is vital for me. I have availed of this resource on numerous occasions and I am very grateful for all the work Nuala and all the tutors have given me. It is a warm, friendly and inviting place and all the tutors have a very high level of maths. The love they have for it is inspiring and encouraging. As this service is very important to so many people, I think that the college should do their utmost to aid the MSC in all it does, ensuring the ratio of tutors to students is adequate, and providing enough room for the masses of people that are usually there! (especially coming up to exams!)

Very helpful. If only there was more room for more people. It can get sort of crowded.

It was extremely helpful in going through the past papers as my lecturer was not very helpful.

Having always struggled with maths at secondary school, I was worried about having to study it on access course. However i was told about maths centre and found the staff very helpful if i had any trouble with certain topics. they ensured you fully understood.

I visited MSC once this year - I only wish I had found out about it sooner.

I found it very helpful in studying for the exams just gone. however without trying to sound harsh there are some young members of staff that may need to improve on areas of study. I found this support extremely helpful and I will definitely continue to go there.

I found it extremely helpful as I was assigned a particularly difficult assignment and the MSC went out of their way to help me and two my friends work it out which included three of the staff trying to find a solution and then one member of staff even e-mailed me notes.

It is very helpful for solving some problems in many real-world applications.

I sat in on a revisionary lecture in statistics I found it helpful but sometimes difficult to ask specific questions afterwards due to time constraints.

Very helpful, the tutors were not familiar with the topic I needed help with but had the resources to research and together we figured it out. I thought that way of teaching was very effective. The staff seemed to go out of their way to help, very positive environment.

I found it very helpful as I am not normally the type of person to go and ask for help about maths, I always try to do everything myself and so when I was struggling with my subject I was very worked up about it and the help I received at the MSC was brilliant.

I was told judgementally at one stage that I would be able to teach myself the topic of my concern if I spent 20 mins in the library, I spend considerable time in the library and I would not have sought assistance at the MSC if I had not exhausted other avenues.

I found the MCS very helpful through all my course. I found the staff were very professional and friendly. I really want to thanks all the staff of the MCS for their support on my Access course to Science and Engineering 2008 - 2009.

It helped me a lot and it helped me to pass. it was a very positive experience.

It helped with last mintute preparation for exams, Vhelpful.

I came 2nd in my maths exam in my class (Access to science and engineering). I attribute my success largely to my attendance at the MSC. It was extremely helpful in clarifying areas to me that I could not follow in class. I would especially recommend it to students whose natural strengths are not mathematical and/or who lack confidence in mathematics. The only negative that I experienced with the MSC was that it was difficult to access close to exam times due to staffing and space limitations. I found that Nuala and her team were excellent teachers and that they had the gift of being able to understand why I could not understand. I would whole heartedly

I found the msc to be extremely helpful, really worthwhile and I have never left the msc with the problem I went in with unsolved! Going there really boosted my knowlegde and understanding of maths and also my grades. the staff are are very helpful and have great knowledge.

It is very helpful for solving some problems in many real-world applications. But I think we can get more peoples to support MSC students, it will improve greatly the mathematics level of students.

From my experience at the msc I found it to be ok! The tutor had a lot of difficulty explaining the area of maths and didnt make a great impact on us. I have heard good reports about the msc though and would definitley go back if I had a problem! I think there is a greater demand for the msc but the size of it is a problem and if there were more facilities I think it would be a greater success and more students would use it!

I thought that the maths support was very beneficial. The staff are really approachable and I found them really helpful. The only problem would be that the space is a little small when a lot of people are there at the one time.

A fantastic support you can ask the questions you cannot ask in a lecture. You can be helped in the area you are weak in. The Centre always makes you feel good about looking for help. Having this resource gives you confidence in taking on further Maths Modules, which I have done Math10030 and Math10060 to support my economic studies.

I did two modules in Maths. Calculus and Matrices and vectors in Semester 1. I got an "A" in both modules.

The Maths Support Centre was like a lifeline to me and when I was studying for my exams I stayed within a short walking distance from them. I don't believe I would have achieved the grades I got without their help especially Nuala who never made me feel silly about any question I asked her. In my opinion it is a vital service to all Maths students as tutorial sessions are too short and infrequent and you can drop in any time to suit your own timetable. Long may it continue.

I found the Maths Centre very welcoming and very helpful in assisting me to solve difficult problems.

Very, very helpful and friendly. Helped with some chemistry problems I had as well as with Maths. I don't think I'd have passed my calculus without their help.

In first year helped with two calculus courses even though there were many people in the Centre, supervisor took sufficient time for each and explained well (I got an A and a C in the courses

In third year studying Biostats; went to extra tutorial (17:00 - 19:00), organised by the MSC; positively surprised as it was for free,; handout helped a lot I got and A+.

They explain things better in specific areas. I have passed my Maths modules with their support. Keep up the good work.

It was very helpful, but a little intimidating at first, this improved later. My biggest regret for the MSC was the departure of Dr Jennings. Best maths teacher I ever had.

Without the help of the fantastic staff at the MSC I would have been significantly less successful in my microeconomics exam last semester, and I feel that if this service was not available I would be much less likely to continue with Economics to degree level. THANKS GUYS!!

I would have passed all three modules if the MSC had better resources = more room, more tutors. I often arrived to find a lot of other students waiting for help, and could not get the help I sought. (Passed two out of three)

The Maths Support Centre always has a welcome for students and provides a fantastic resource for students.

Without Nuala, Ronan, Tom and the rest of the staff I would have definitely failed the three mathematics modules which I took in the first semester – instead I got "B" grades in all three. Thanks Guys.

I brought a list of questions to ask the staff and they ran through the answers with me. I find this better than a "now you try this approach" as you learn more. This should be put on the signs... "bring a list of your problems with you". It is often simple, abstract concepts which I didn't get while I could usually do the hard stuff. I didn't like working in the group because it slowed me down, particularly when I had done so much study and came prepared while they had done the bare minimum. I also thought it unfair on the

mentor as he could have dealt with my problems in twenty minutes, therefore lightening his work load. Otherwise brilliant. A great resource for people who have nowhere to go for help.

I had a very pleasant experience with a lovely lady tutor. She was very knowledgeable and helped me understand the basic concept in my statistics class so it was easy then for me to understand what came next in the class. I will be popping in again this semester no doubt!

*I popped in, was pointed to a seat by friendly person, asked question, which was promptly and effectively gone over with me.
Presto! Problem understood.*

The tutors were really good and I never would have understood or passed my module without their help. But the room is tiny and could easily and quickly become very full and cramped which made it harder to get the work done.

It was very helpful, and without it I wouldn't have passed my exam. It is a friendly area, with staff who are helpful and patient.

Good learning experience that allowed me to achieve a decent grade in a difficult topic for me

I found the staff very friendly and willing. They reassured me and put me at ease about my issues (in my case stats from my Phd) Nuala is a very nice and eager to help and took a lot of time to attempt sort out my issue, and put me in contact with Jason Wyse who had a stats background. Jason was able to produce the stats results I needed to support my research and enabled me to successfully complete my PHD.

It help my understand and sort out an area in which I had a problem

Nuala and her team are excellent. The only problem was the size of the venue. Sometimes the noise level was disturbing only because the venue is so small. I don't think it's fair to ask Nuala and her team to operate under such cramped conditions. Likewise for the students.

I know that some of my fellow students attended the MSC because I told them how good the support is. Please just allocate a larger room.

Really amazing, I dislike maths greatly due to the fact that I have always found it difficult and the thought of doing it at third level was scary. The support centre got me through maths and helped me to achieve the grade I needed. It was a small room but I found that a great comfort because you didn't feel as alienated when you're in a big lecture hall, scared to even to ask a question. The people were friendly and patient and that was the best thing for me because there is nothing worse than not understanding something and someone getting impatient! Absolutely brilliant facility, don't know what I would have done without it! Thank so much

I found it very helpful the teachers are really kind and help you go through the exam papers until you understand. I would not of got an A with out it Thank you for your help.

I find it extremely useful to be able to just drop in and have someone help me with any specific problems I happen to be experiencing, such as a particular proof or question on a problem sheet. Thanks for a great service!

MSC is nothing to be ashamed about. There not going to tell your lecturer, your college mates won't know unless they are there too. It's a great way to learn if you have missed a lecture or have just sat in a lecture not understanding a single thing a lecturer says. The people don't judge you if you don't know basic maths, they support you with all their might.

Using The MSC was the best thing I ever did, I went the day before an applied biostats exam knowing nothing and got 100% in the exam! I would definitely recommend it to anybody studying maths modules and plan on going again soon!

I found MSC really welcoming, helpful and motivating. MSC staff are extremely helpful and understanding, and they don't make you feel like an idiot if you don't know something (like my maths teacher in school did if you didn't know the answer!). Thanks for your help and keep up the good work!

Each time I visited the MSC, everyone was so welcoming and helpful. Each tutor did everything they could to help me. Even when the maths weren't their area or expertise (ie economics or statistics) they found someone who could help or told me what day is best to come in. The best part though is the way it made me want to be better because it felt like the tutor really wanted me to understand and improve.

My experience with MSC is very positive of course it has prepared me for the tutorials and gave me the confidence in knowing what i was doing. I was always approached by people that were helpful , patient and understanding. The opening hours and atmosphere were convenient and i received professional help any time i walked into MSC.

I found that the msc was very helpful indeed. Everyone is willing to help you out in every way possible and i greatly appreciated it.

I just wanted to say that my experiences with the MSC was very positive. I found the tutors very helpful and friendly and visiting the MSC definitely helped me with my exams.

The only thing I would think to change is the size of the office, a larger room would be preferable as every time I have visited you there are always a lot of people and I find myself lucky to find a seat.

Thank you for the continuous support throughout the year.

I loved the msc. Its a huge help. Thank you very much.

I found tutors to be helpful and knowledgeable frequently they explained concepts more clearly then the lecturers should have more room to accommodate the large number of students requiring

assistance.

The tutors were extremely helpful and approachable. I would definitely recommend it to others. The fact that the tutors were able to break down certain topics for me really helped in my understanding of certain maths modules. If necessary I will make use of the centre again.

*I wouldn't have passed my statistics module without your help as i have a very poor grasp of maths, but managed to get an a+ in the exam thanks to the support centre. the only thing i feel could be improved is if you got a bigger room somewhere, as the current one can feel a little claustrophobic.
thanks again for all your help throughout the year!*

I found it helpful with maths in general but with the relevant math for specific modules - maybe not so good.

I found it very helpful but I think maybe at key times like coming up to the exams, there should may(be) have been more staff and a lot more space.