



Maths Café



Internal Evaluation Report

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1. Introduction

The Maths Café is an initiative that was implemented by Brunel University with part funding received from the West London Lifelong Learning Network (WL LLN). The project was instigated by the Maths Working Group which was formed by the WL LLN. This group was seeking opportunities to develop projects with the aim of improving the retention of non-traditional students. During a meeting held at Brunel University, facilitated by Colin Everest (from the WL LLN), lecturers involved in teaching undergraduate mathematics to non-mathematicians discussed their experiences of students realising, at a relatively late stage, that they need help with the mathematical content of their course. One of the main reasons for this late awareness is that many of the quantitative modules are assessed summatively at the end of the year. The idea of running a two-week Maths Café was based on a model that is used at the University of Portsmouth (2008), where maths drop-ins run on a daily basis, throughout the year for two hours in the Student Union coffee shop. In a similar way, Brunel University ran a drop-in service for two weeks over the revision period to provide tutorial assistance to any student urgently needing help as the examination period approached. Not only was one-to-one support provided, but paper- and computer-based resources were also available.

This project ran as a pilot study to identify the main mathematical issues students needed help with and more importantly, to identify what courses these students were studying. This information will then be used to design a more integrated approach to supporting students in the following and subsequent academic years.

This evaluation reports on our experiences of running the café, provides details of the students who were attracted to the café, and reports back on students' perceptions of the initiative.

2. The Implementation of the Maths Café

2.1 The set-up of the café

The location of the café was important since it needed to be situated somewhere central and visible to students. The Learning and Teaching Development Unit (LTDU) is involved with the LearnHigher Centre of

Excellence in Teaching and Learning (CETL) (www.learnhigher.ac.uk) and received funding from this CETL to construct a room that could be used by students as a learning space. The room at Brunel University (referred to as the LearnHigher Centre) is situated at the front of the Lecture Centre; two of the walls of this room are glass, so that people walking past can look into the room. The location and visibility made this an ideal room to use. The seating capacity, with tables, is 20 and standing capacity, with no chairs or tables, is 50; hence it is a small teaching room.

To keep with the café theme, the room was set up with tables that were covered with chequered red and white table cloths, and fresh flowers were placed on all tables (see Figure 1). Free coffee, tea and snacks were laid out twice everyday, once at 10am and again at 1pm. The teas and coffees were ordered in-house via the catering service, but all the snacks were ordered online from a supermarket chain, as it was more cost effective.



Figure 1: The LearnHigher room dressed up in a café style

Although 20 laptops are available for use in the LearnHigher Centre, it was anticipated that students would be mainly using paper-based resources (such as lecture notes and text books); hence only two laptops were set out for students to use to access online learning resources. This proved to be adequate. The paper-based resources that were made available to students were a combination of materials provided by the maths support tutor at Brunel University (who works as part of the Effective Learning Advice Service (ELAS)) and from the nationally available Mathcentre

(www.mathcentre.ac.uk). These paper-based resources were situated near the door, the idea being that students would be drawn to the freely available resources (see Figure 2). The paper-based resources covered a wide range of topics. Initially only twenty copies of each resource was made available, since the uptake of the paper-based resources was not known.

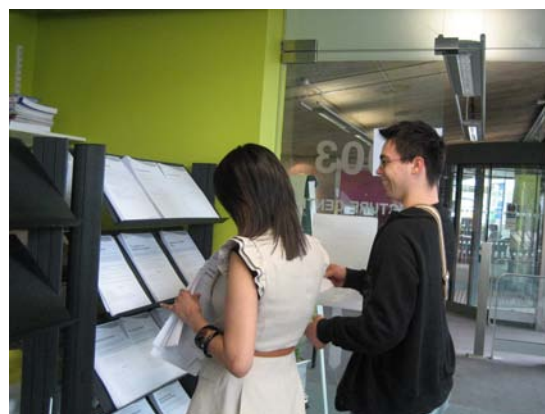


Figure 2: Students accessing the paper-based resources which were displayed by the entrance to the room

The opening hours of the café were from 10am – 4pm, Monday to Friday. The start date of the café was Monday 14th April and the end date was Friday 25th April, since this was the two week revision period before examinations started. In total, four members of academic staff were involved with the running of the café. Two of the members, Dr Martin Greenhow and Dr John Newby (both senior lecturers), have vast experience of teaching undergraduate mathematicians and non-mathematicians. The maths support tutor, Dr Mundeep Gill, has specialised experience of supporting non-traditional students and non-mathematicians from a wide range of courses. The fourth member of the team, Justin Hatt, is a PhD student who has been a Graduate Teaching Assistant (GTA) over the last four years on Level 1 and Foundation level modules in Mathematics. A timetable was set up so that at all times during the opening hours 2 members of staff were present.

2.2 Advertising the café

Advertising for the café started a week before the event to inform both students and staff. Different strands of advertising were used to promote the event to as many students as possible.

- All lecturers teaching foundation and level 1 mathematics modules were contacted via email and told about the project. They were sent all the details of the café (i.e. dates it was running, opening times and location) so that they could pass the information to their students.
- An email advertising the café was also sent out to all students who had received maths support via the ELAS.
- Leaflets were designed and sent to the university's print room for bulk printing (see Appendix 1) and distributed to all central services (Student Services, Student Union, Library, Counselling Service, Placement and Careers Centre, Disability and Dyslexia Service) and to key Schools within the university (specifically the School of Engineering and Design and the School of Information Systems, Computing and Mathematics), which teach a large proportion of quantitative modules.
- A web-page was also developed which advertised the café. This was hosted on the ELAS website on the university's intranet.
- A banner advertising the café (which linked to the webpage) was loaded onto the university's virtual learning environment (VLE). This meant that anyone logging into the VLE would see the message advertising the café.
- The event was also advertised via the various plasma screens that are distributed around the campus.
- A sign was put up on the glass window of the LearnHigher Centre.
- The final advertising strand was using paper that had the Maths Café logo on it throughout the duration of the two-weeks while working on material with students (see Appendix 1). This was done so that when students left the café their peers could see that they had accessed the support and hence might have been encouraged to take up the opportunity that was available.

2.3 Recommendations

This project was the first of its kind to take place at Brunel University and was a learning process for everybody involved. What was learnt from our experience was that the location and visibility of the room used was pivotal to the success of the project (see section 3). Although many strands of advertising were used to promote the café, which helped to create the initial “buzz”, a major catalyst was the fact that students were able to see the activities taking place in the LearnHigher Centre from outside and were able to walk straight in to find out more. From walking past the room it could clearly be seen that the room was set up differently (with the look and feel of a café) and that it was student-focused.

The paper-based resources that were placed by the door also helped pull students in. Initially, only twenty copies of each resource were made. However, by the end of the first day these resources had all been taken and additional copies were produced overnight. This pattern of demand for the paper-based resources continued for the first three days, by which point a decision was made to make bulk copies via the internal print room (100 copies of each). This was a sufficient amount and it would have been ideal to have had this in place at the start of the café.

The maintenance of the café during the two-week period was sustained by one of the tutors who was also working full time in the café. Although it worked, this was not an ideal situation, especially since the maintenance involved the setting up of the room throughout the day (which was required because of the large number of students accessing the café on a day-to-day basis), replenishing the snacks, restocking the paper-based resources and other similar tasks. In future, and for other such projects, it may be ideal to have a student helper involved with the project to help with the initial organisation of the initiative and to deal with the day-to-day running of the café.

3. Evaluation of the Café

3.1 Evaluation Process

The Maths Café was evaluated to identify which students were accessing the support available and what topics/areas of mathematics they had problems with. To capture this data, students were asked to complete a self-registration/evaluation form (see Appendix 2) after they had seen a tutor. They placed their forms in a closed box in the room (in order to keep anonymity).

The evaluation form asked students to state their:

- Name;
- Gender;
- Student number;
- Email address;
- Previous maths grade (at GCSE and A-level, if applicable);
- School;
- Course;
- Level of study.

Additionally, students were asked to state/describe the mathematics problem they needed help with. This was done to encourage students to think about and be clear about the problem(s) they were having, rather than asking for help with a complete topic or even just saying that they “needed help!”.

The second half of the evaluation form asked students to give feedback about the service received. This was kept short so that students would not have to spend too much time on this aspect of the evaluation. They were asked three simple questions:

- How useful they found the advice/support given;
- How the café could be improved;
- Any other comments.

By day two of the project, two problems with this evaluation process became apparent. First, the return rate of the evaluation forms was seen to be less than 50%. Second, students who accessed support on both days complained about having to complete the form twice. To increase the rate of return of the

forms, students were given the evaluation form to complete before they saw a tutor. It was hoped that they could complete the first half (the longer section) while they waited and then be reminded to complete the feedback section by the tutor after they had received help. Additionally, to ensure that the correct data was being captured, in terms of number of students accessing the support, a tally was kept by the tutors of the number of students they saw on a one-to-one basis.

To overcome the second issue, a shorter evaluation form was created for students who had previously completed the longer form (see Appendix 2). This new form simply asked students their name, mathematics problem and the three feedback questions. Informal observations and conversations with returning students indicated that they were much happier with having to complete this shorter form, although the rate of return did not increase.

However, having two evaluation forms did lead to some confusion; students were unsure of which form they were to fill in and most often opted to complete the shorter form. A way to overcome this issue may be for the tutors to collect student details (i.e. the first section of the evaluation form) themselves before they start the one-to-one session. At the end of the session, students could be given the feedback form and asked to complete the three questions. This would ensure that accurate information is collected from all students, but would mean that valuable tutor time is taken up with a form filling process. However, this would increase the rate of return of the evaluation forms and allow for the collection of data from all students who receive one-to-one support.

Before the café started it was hoped that the evaluation form would be sufficient to collect all the relevant data in terms of the number of students and student information. However, an unforeseen outcome of the project was that students accessed the café to make use of the room as a learning space, working with peers to help each other and work together (see Appendix 3 which shows photographs of how students used the LearnHigher Centre as a learning space). This was a positive outcome, and when probed, students stated that they wanted to work in the room since they knew there was help on hand if they needed it. However, at peak times the room did get very

crowded and it was difficult to identify those students who wanted to work on their own (or in small groups) and those working while waiting for a tutor. In future, what may be worthwhile will be to have a waiting list so that tutors could simply call out students' names from a list.

Although the number of evaluation forms collected provided some information in terms of the number of students who received one-to-one support, what they did not capture was the number of students that accessed the café as a learning space or to use the freely-available paper-based resources.

3.2 Results

The results obtained from the evaluation forms will be analysed in three sub-sections:

- Demographics of students accessing the café;
- Topic areas students required support with;
- Feedback received from students about the café.

The first two sub-sections will indicate the types of students that accessed the café (in terms of level of study and course) and will report on the most common issues that students needed help with. This should help us plan for more structured support to be offered to students in the next academic year.

The third sub-section will report on what students thought about the initiative; this will be used to make recommendations for future Maths Cafés and other similar initiatives.

3.21 Student Demographics

Using the data collected from the completed evaluation forms and from the tallies maintained by the tutors, it has been estimated that approximately 352 students accessed one-to-one support during the two week period. Figure 3 shows a break down of the number of sessions on a day-to-day basis.

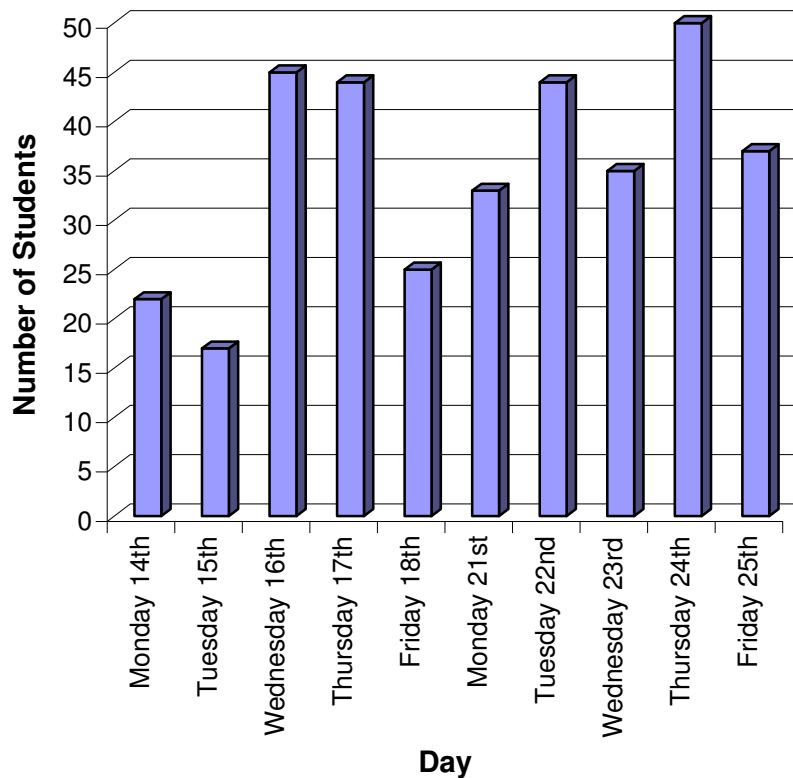


Figure 3: Number of students who received one-to-one support each day throughout the duration of the café

The figures for the first two days (Monday 14th and Tuesday 15th) are not as high as the other days, but these are the two days where the number of evaluation forms returned was the only data available. It is estimated that only 50% of evaluation forms were returned on these two days. The last Thursday of the café was the busiest, with 50 students accessing one-to-one support. This can be interpreted as each tutor seeing 25 students in 6 hours, (4 students per hour). Other peak days were Wednesday 16th, Thursday 17th and Tuesday 22nd, with over 40 one-to-one sessions taking place on each of these days. What is apparent from Figure 3 is that students made use of the café every day over the two week period. There is no one day where it might be suggested that the café may not have been worthwhile running.

Figure 3 only shows the number of students who received one-to-one support. These figures do not include students who came to the café to access the paper- and web-based resources or those students who made use of the café as a learning space.

From the estimated 352 students who accessed the café for maths support, only 198 students completed an evaluation form (a return rate of 56%). From the data collected from these evaluation forms it was found that there was a higher percentage of male students accessing the café (see Figure 4). This may indicate that either male students prefer the casual drop-in nature of the café or that more male students are involved in quantitative modules. Further analysis will be done to examine this in more detail outside of this report.

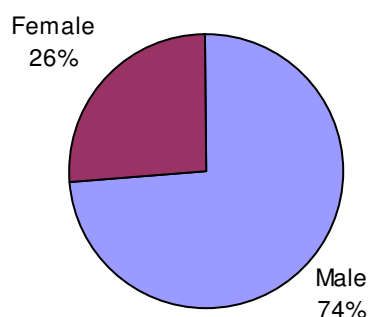
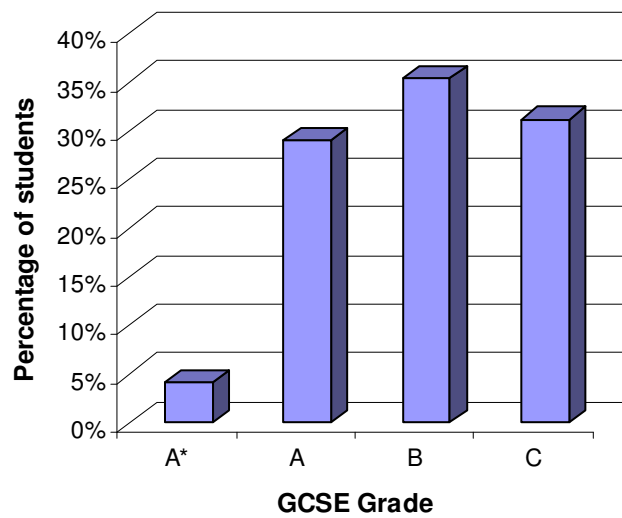


Figure 4: The distribution of students in terms of gender

The aim of the café was to support non-traditional students, and those students who are enrolled on highly quantitative modules and have not completed an A-level in mathematics. It was therefore important to find out students' GCSE grade in mathematics and A-level mathematics grade, if applicable. Of the 198 students who completed an evaluation form, only 141 students disclosed their previous exam results. Figure 5 illustrates students' previous grades in GCSE and AS/A-level mathematics.

Graph (a)



Graph (b)

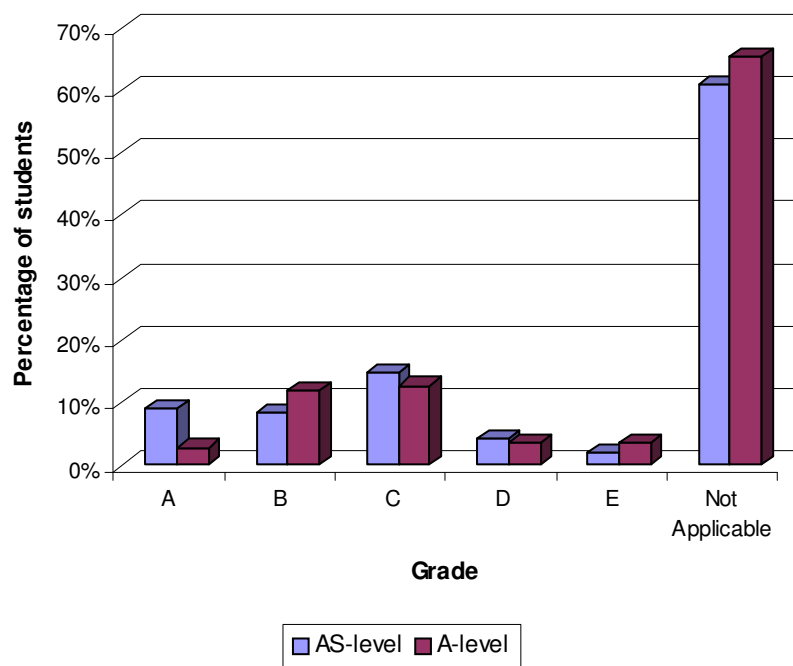


Figure 5: Graph (a) shows the mathematics grades students achieved at GCSE and (b) shows the grades students achieved at AS and A-level. Graph (b) also indicates the percentage of students who did not complete an AS/A-level in mathematics.

From Figure 5 it can be seen that students' GCSE grades were split relatively equally between grades A, B and C, with a small percentage achieving an A*. The second graph in Figure 5 indicates that many of the students who

accessed the café had not done an AS- or A-level in mathematics (61% and 65% respectively). Students were clearly taking modules that had a quantitative aspect and hence needed support to help bridge the gap between GCSE mathematics and undergraduate mathematics.

Clearly the requirements students had in terms of the topic areas they needed assistance with may depend on the Academic School (or Department) in which students are enrolled. Figure 6 shows the distribution of students by Schools (Figure 6a) and by level of study (Figure 6b).

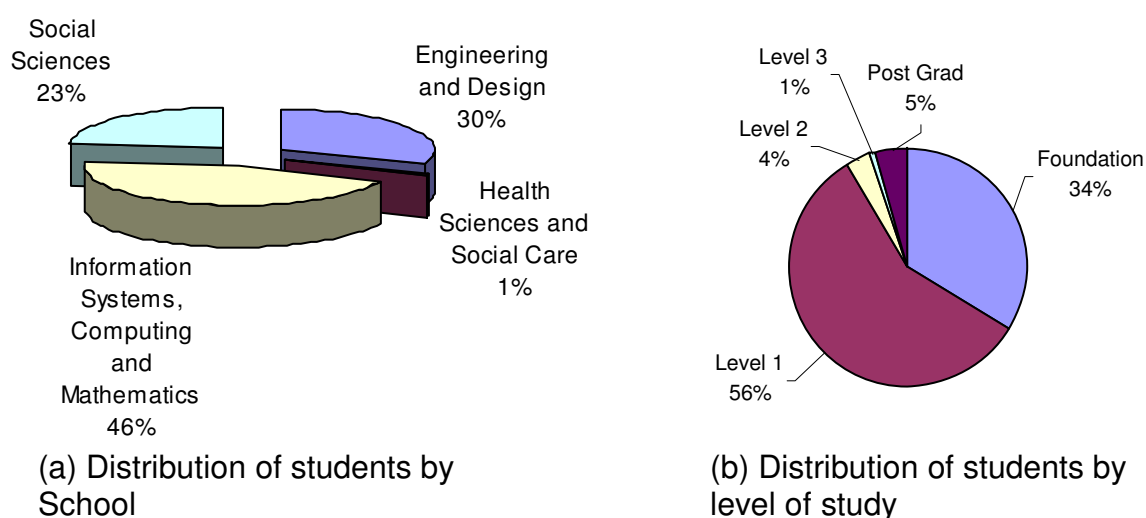


Figure 6: Distribution of students by Academic School and level of study

From Figure 6 it can be seen that Students were from three main Schools (from a possible seven). These Schools were the ones where it would be expected that students would be studying quantitative modules. A very small minority of students were from the School of Health Sciences and Social Care, which may indicate that students had a need for maths support, but not many took advantage of the support available. It may have been that students from this School had not been targeted as well as the three other Schools so for future initiatives more direct publicity may be required (see section 5 for future recommendations).

As expected, the majority of students who accessed the café were from foundation level and level 1. In terms of aiding with retention, these students

were the target group; hence the café was set up successfully and advertised in a way which encouraged students from key groups to access support.

The café was publicised as “any course, any level” and 5% of students who accessed the café were postgraduate students. The needs of these students were very specific to the area of expertise they were involved with and it was difficult for the tutors to support this group of students, although as much help as possible was given. Additional to their needs being very specific, a lot of time was spent with these students in an attempt to understand their problems and it was felt this time should have been spent with the target group, especially at peak times (see section 5 for future recommendations).

As well as knowing the Academic School and level, it is also useful to know which programme students were enrolled on. This information will enable more structured mechanisms of support to be integrated into the different programmes in the next and subsequent academic years. Figure 7 shows the distribution of students by Academic School and programme.

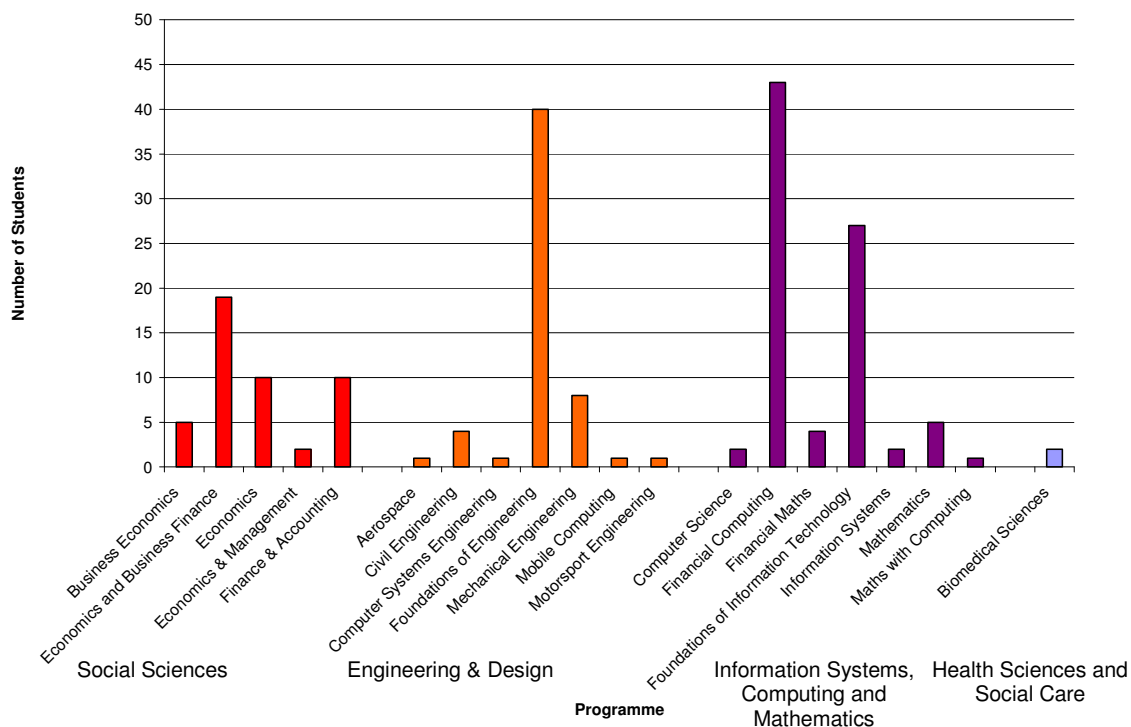


Figure 7: Distribution of students by Academic School and course.

From Figure 7 it can be seen that the majority of students who utilised the Maths Café from the School of Social Sciences were enrolled on a course which was a strand of Economics; for example, Business Economics, Economics and Finance. Although the programmes on which students were enrolled were different, the core quantitative module was common to all of them - Mathematics for Economics.

The programmes students were enrolled on from the School of Engineering and Design were all different, which indicates that a broader range of courses from this School involve mathematical aspects. However, the Foundations of Engineering course was the most common one from which students were accessing maths support. This is a foundation level course in which students need to achieve an average of 55% to progress to a course in Design, or 50% to progress onto a Bachelor of Engineering course. Hence, students need to pass their examinations (achieving at least 50%) to progress into level 1. Considering that a high percentage of students enrolled on the Foundations of Engineering course have only got 160/180 A-level points and depending on whether they have studied maths at A-level or not, they needed support to build confidence and fill knowledge gaps in the subject area. This is clearly indicated by the large number of students who accessed the café from this course. Ideally, this support should have been utilised throughout the academic year by the students; one-to-one support was available all year round, but students chose not to use it or did not know about it.

Approximately 46% of students who accessed the café for one-to-one support were from the School of Information Systems, Computing and Mathematics. The majority of students from this School were from two programmes, Financial Computing and Foundations of Information Technology. Students enrolled on these two courses clearly needed support to fill knowledge gaps and build confidence in the lead up to the exams. The entry requirement for the two programmes differ considerably, 260 A-level points for the financial programme and 160 A-level points for the foundation programme, however, AS- or A-level mathematics was not a requirement for either programme.

The data presented in Figure 7 indicates that for future academic years more integrated support mechanisms need to be incorporated across three Schools, and four programmes: Economics, Foundations of Engineering, Financial Computing and Foundations of Information Technology.

This is not to say that students from other strands of programmes or Schools do not require mathematics support, but that these four programmes are ones where students are enrolled in quantitative modules that may be above their current capabilities and need more guidance and support to overcome particular difficulties.

3.22 Topic areas students required support with

In addition to knowing which programmes students were from, it was also important to identify what topic area students needed help with. Students were asked to state this on the evaluation forms. In total, students requested help with 38 topics, which have been grouped into 5 categories (see Appendix 4 for raw data). Figure 8 shows the percentage of students who required help with a topic within each of these 5 categories.

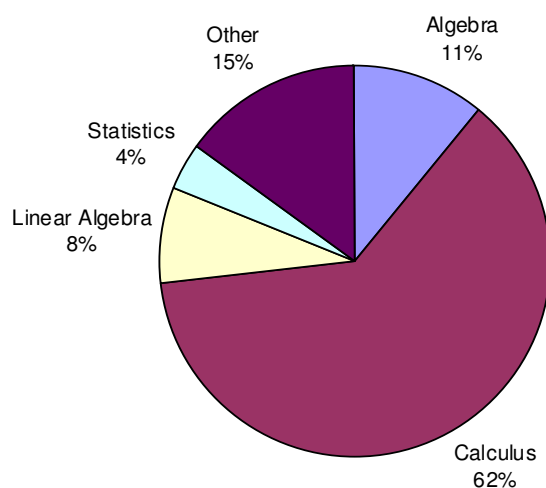


Figure 8: Chart showing the percentage of students who needed help with each topic area.

Four of the five categories that students required help with clearly state the strand of mathematics. However, the “other” category covers topics that fell outside of these four strands, for example, Graph Theory, Discrete Mathematics (see Appendix 4 for a complete breakdown of the topics within each category).

From Figure 8 it can be seen that 62% of students stated that they needed help with Calculus. However, their difficulty, most often was not being competent with basic Algebra (for example, not knowing the rules of indices). In most cases, students could apply the basic rules of Differentiation and Integration but were unable to handle the algebraic manipulation needed to simplify their answers. Figure 8 also indicates that by the revision period, most students feel they are confident with the algebra aspect of their module, since only 11% of students requested help with this particular area. However, it could mean that students are “less interested” in the foundations of their course (i.e. the algebra aspect of their module) and focus most of their revision on the more difficult aspects of the module. This is a suggested interpretation of our experience in the Maths Café. Students’ examination scripts could be analysed to identify whether or not this is the case.

Alternatively, this could indicate that more time needs to be allocated within the module to focus on Calculus so that students have time to build knowledge and confidence with this topic area.

The majority of students (81%) required help with mathematical methods, rather than statistics. Only 4% of students requested help with this subject area. This could be for a number of reasons:

- Students find statistics easier than mathematical methods;
- more students undertake modules in mathematical methods than statistics;
- the advertising did not promote statistics as a specific strand.

In one way, the tutors involved with providing the support had very basic statistics knowledge so were grateful for the fact that not many statistics based requests were made. However, there is a need to support students with statistics in the future (see section 5).

One of the main reasons for collecting this form of data, i.e. topics students needed help with, was to assist with thinking about the type of support that could be integrated into modules over the next academic year. For this reason, the topics students required help with have been broken down into Schools and key programmes (see Appendix 5).

3.23 Feedback received from students

Not only was it important to collect information to identify the student demographic, but it was also important to collect feedback from students. The feedback collected from the evaluation forms was kept brief but general, so that students could make comments and suggestions for any improvements.

To identify whether students found the support provided via the one-to-one tutoring useful, they were asked to complete a Likert scale question (see Appendix 2). The results from this section are shown in Figure 9.

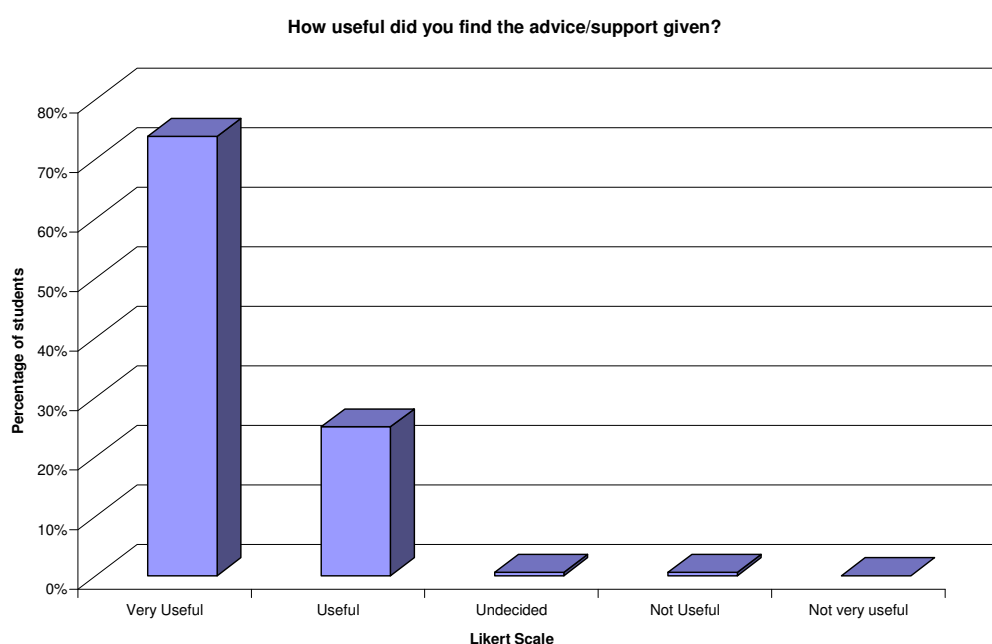


Figure 9: Results from feedback question asking students to rate how useful they found the support given.

The results from Figure 9 indicate that a large proportion of students found the support and advice given very useful (74%) or useful (25%). Very few students said they were either undecided (1%) or found the advice not useful (1%). This shows that students found the one-to-one nature of the café useful in helping them to gain knowledge with the topic area they had problems with. It also indicates that the tutors were able to provide effective assistance with the wide range of topics.

As part of the evaluation of the café students were asked how they thought the café could have been improved. From the total number of students that completed an evaluation form, 45% made at least one suggestion for improvement. The most common response was that 33% of students thought it could be improved by having more tutors present. Although there were two tutors present at all times, quite frequently over the two-week period the room was filled to maximum capacity, which meant that all chairs and table spaces were occupied and there was very little standing room available. Hence students had to wait for a short period of time before they had a discussion with a tutor. The exact waiting time, however, is not known. When the café was at maximum capacity, tutors kept to a 20 minute limit per student so that more students could be helped and so that students were not waiting for an excessive amount of time before being tutored. This was a reasonable adjustment to make and worked well. Whether or not the number of tutors can be increased depends on the amount of funding available for such a project. Another suggestion that many students (27%) made was that they wanted the duration and opening times of the café extended. The café was open from 10am – 4pm, for a two week period (which coincided with the university's revision period). Some of these students said they would have liked the café to be open during the actual examination period. One of the concerns with running the café over the examination period is that we do not want to encourage students to leave their revision until the very last moment before the exams start. Additionally, students could still have made use of the one-to-one service that is provided by the ELAS for help with Mathematics, Statistics and Numeracy throughout the year. It is anticipated that experience of receiving effective one-to-one tutoring through the Maths Café will encourage

the same students next year to access the Service in a more timely manner as and when they realise they are having difficulties. In terms of extended opening hours, this would need more finance and more tutors, since the four tutors were stretched with the hours and days they worked over the two week period.

A few students (8%) commented that they would have liked there to be more food available. This came down to the pre-ordering of the food and not expecting the demand for the café to be as high as it was. With any such project it is difficult to forecast the take-up by students. However, not many students said this which suggests that a large proportion were satisfied with the amount of free snacks and drinks that were available to them.

A very small minority of students (3%) stated that they would have preferred the tutors to have subject specific knowledge. This comment was only made by students from the economics course, where the mathematics terminology is slightly different to that used in mathematics and engineering. However, for the most part, this was not an issue for either staff or students.

Other suggestions made were more general and were one-off comments, such as, running the café more times throughout the year and running revision workshops parallel to the café. 4% of students stated that no improvements could be made to the café.

All the suggestions made by students were positive and are feasible to implement, e.g. extended opening hours. However, most of these suggestions, if taken up, would depend on the amount of funding that is available.

The last part of the student evaluation was to ask students for any other comments they had about the Maths Café. The comments made in this section by students were messages of appreciation (see Appendix 6 for all comments made in this section). A sample of some of these messages is:

- Thank you for your support.
- It was too good – no need for improvements.
- Explanations given were very good.

- Very knowledgeable and understanding teachers.
- I was amazed at the level of support that was given to me.
- Friendly and helpful.

This indicates that the café and the tutors involved promoted an environment that was friendly and open where students were not afraid to disclose what they did not know or understand. Students also appreciated the support that was given and found it useful.

Overall, these comments and the feedback received from previous questions indicate that what was provided was sufficient and met the needs of the students.

3.3. Conclusion

The Maths Café was evaluated to identify

- which students were accessing the support available (in terms of modules, programmes and level of study);
- the topic areas students needed support with (so that a support mechanism can be integrated into any key courses identified from the project in the following and subsequent academic years).

Feedback was also collected from students so that students' perceptions of the project could be identified.

All the above information was collected by the use of evaluation forms, which students were asked to complete before and after they had seen a tutor. Two issues arose with using one form to collect all the data; some students did not complete it, and the returning students did not like having to complete such an extensive form repeatedly. To overcome this issue, a shorter form was developed for returning students, but, this led to some confusion as to which form was the correct one to complete. Initially, the evaluation forms were the only information we had to monitor the number of students that were accessing the café. Since not all students completed a form, tutors began keeping their own records of the number of one-to-one sessions they did. Although the number of students who made use of the LearnHigher Centre, either to access the resources or to use the room as a learning space, was

not monitored, what was seen was that the room was set up and used in a manner that encouraged students to enter the room and make full use of the resources available to them (see Appendix 3).

The analysis of the evaluation forms indicated that the Maths Café was used by a wide range of students from a number of different courses and levels of study. However, most students had not completed an AS- or A-level in Mathematics (61% and 65% respectively) and were from level 1 modules (56%). These students needed support to bridge the gap between GCSE and undergraduate level mathematics.

The students came from four main programmes:

- Economics,
- Foundations of Engineering,
- Foundations of Information Technology and
- Financial Computing.

A high proportion of students needed help with Calculus (62%). This information can be used to provide more structured forms of support for students on these courses in the following and subsequent academic years.

As well as identifying the student demographic it was also important to collect feedback from students to identify their perceptions of the café. 98% of students found the one-to-one advice/support given as very useful or useful, which signifies an exceptionally high satisfaction rating.

Students were also asked to make suggestions as to how the café could be improved. Most of the suggestions made were feasible, such as more tutors, extended opening hours, running the café for longer than two weeks, etc. All these suggestions can be implemented into future Maths Cafés. However, they are limited by how much funding is actually available and by the size of the LearnHigher Centre since the location of the café will remain the same because the location and visibility of the room was a contributing factor to the success of the project. Although these requests are seen by students as potential improvements, the last section of the evaluation form, which asked students for any other comments, indicated that students were very happy with the support that was provided to them via the café and appreciated the

help that was given. This indicates that the current structure of the café was successful, useful to students and was one that worked well, within the constraint of the budget.

4. Evidence of Impact

This evaluation is written within two months of the Maths Café event and impact information is unavailable at this time. The aim of providing maths help for a greater number of students than have accessed the ELAS throughout the year has been achieved (of the 198 for whom we have information, 162 had not accessed the ELAS before the Maths Café).

In order to assess the impact of this additional help, it is necessary to consider the outcome in terms of student achievement in the examination for which they were preparing.

Examination results will be available in August and some statistical analysis will be undertaken, whilst recognising that the nature of the project and data collection would limit the power of such analysis to provide firm conclusions.

5. Future Recommendations

The report above outlines our experience of implementing and running a Maths Café, which had the aim of retaining students. Although the project was seen as a success by everyone involved, students and staff included, there are a few things that we will do differently when we run a similar initiative again, namely:

- having a student helper involved with the project to help with the maintenance of the café;
- bulk photocopy the paper-based resources;
- a waiting list so that tutors can distinguish between students waiting to be seen and those that are using the facility as a learning space to work independently;
- a shorter evaluation form.

One of the issues that did arise during the café was accommodating the needs of postgraduate students. Although only a small minority of students were postgraduate (5%), the time that was spent with these students trying to understand their specialist topic could have been spent with students who had more pressing needs (since undergraduate exams were starting as soon as the café was over). The advertising of the café should be clear as to who the target audience is. This has highlighted that whilst there is a need to support postgraduate students as well as undergraduates, the Maths Café was not the right environment to do this.

As expected, most students were from three Academic Schools. However, a small minority of students were from the School of Health Sciences and Social Care, which indicates that there is need in terms of supporting students taking quantitative modules from this School. This suggests that in future a more directed approach may be needed to publicise such activities as the Maths Café to the School of Health Sciences and Social Care.

Another form of support that was met by the tutors working in the Maths Café, but not necessarily with the right expertise, was statistics support. Although only 4% of students needed assistance with this subject area, it is an area that needs more expert staff available to help and support students. The publicity did not specify that help with statistics would be available, but in future it may be ideal to have specific times when a statistician is available to help students.

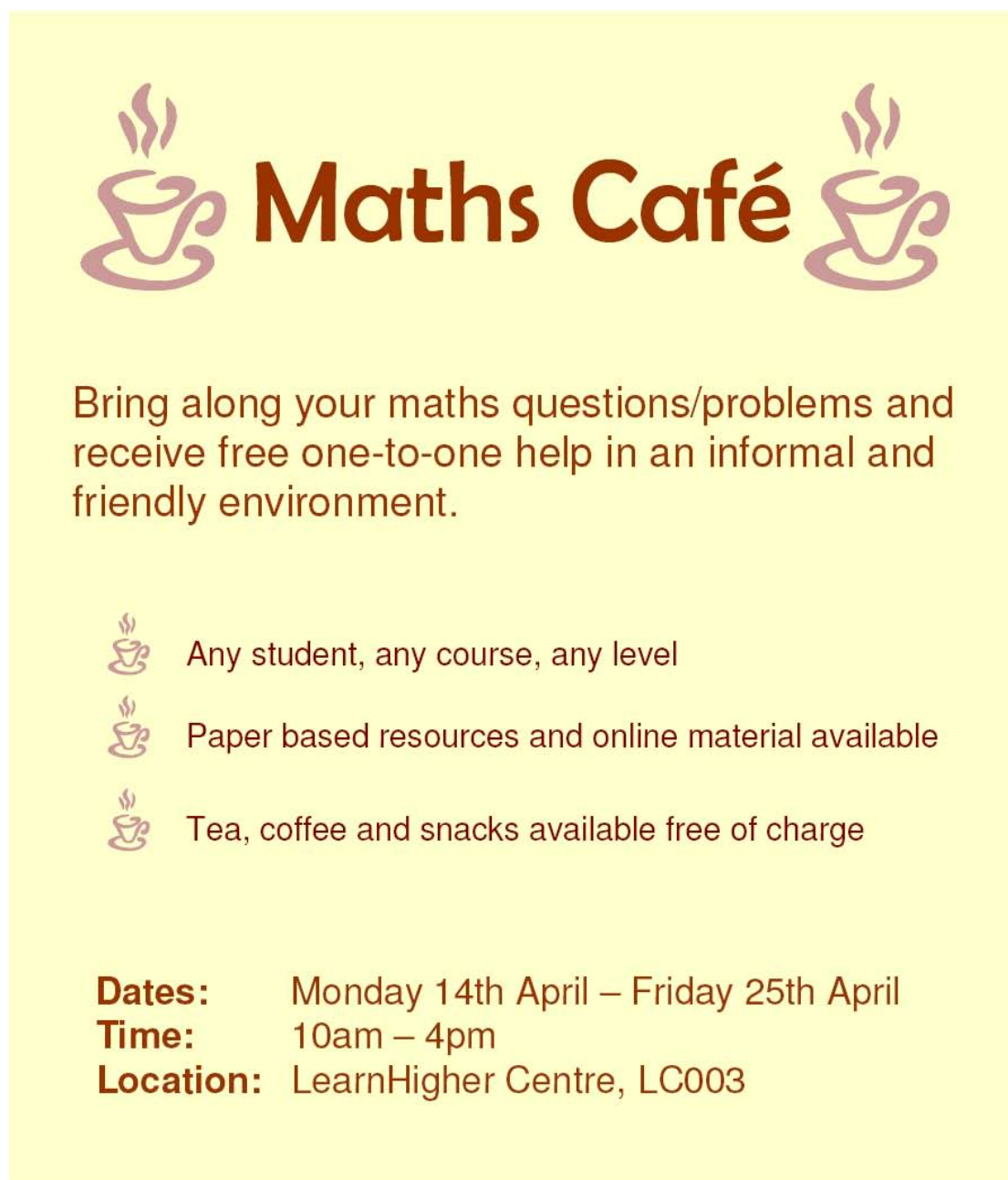
6. References

University of Portsmouth (2008) [online]

<http://www.port.ac.uk/lookup/supportandadvice/mathscafe/> (Accessed 1st June, 2008)

Appendix 1




Leaflets that were distributed to promote the Maths Café and paper that was used throughout the two-week period.



The leaflet features a yellow background with the Maths Café logo at the top, consisting of two coffee cup icons flanking the text 'Maths Café'. Below the logo, the text reads: 'Bring along your maths questions/problems and receive free one-to-one help in an informal and friendly environment.' This is followed by three bullet points, each preceded by a coffee cup icon: 'Any student, any course, any level', 'Paper based resources and online material available', and 'Tea, coffee and snacks available free of charge'. At the bottom, the dates, time, and location are listed: 'Dates: Monday 14th April – Friday 25th April', 'Time: 10am – 4pm', and 'Location: LearnHigher Centre, LC003'.

Maths Café

Bring along your maths questions/problems and receive free one-to-one help in an informal and friendly environment.

-  Any student, any course, any level
-  Paper based resources and online material available
-  Tea, coffee and snacks available free of charge

Dates: Monday 14th April – Friday 25th April
Time: 10am – 4pm
Location: LearnHigher Centre, LC003

Appendix 2

Evaluation forms that were used to collect student information

Evaluation Form

The information collected in this evaluation will be kept strictly confidential and no information will be passed to any Schools or course leaders.

About you

Name:					
Gender:	Male				Female
Student Number:					
Brunel Email Address:					
Previous Maths Grade	GCSE:		AS:		A Level:

School (circle one): Arts Business Law Eng & Design Health Sciences and Social Care ISCM Social Sciences Sport & Education

Level: Foundation L1 L2 L3 PG

Please state your course (e.g. economics) _____

Please state/describe the maths problem you would like help with:

Feedback about us

How useful did you find the advice/support given: (please circle one) Very Useful Useful Undecided Not Useful Not very useful

How could the café be improved?

Any other comments:

Shorter form that was used with returning students

Evaluation Form

Name:	
-------	--

Please state/describe the maths problem you would like help with:

Feedback about us

How useful did you find the advice/support given: (please circle one)

Very Useful

Useful

Undecided

Not Useful

Not very useful

How could the café be improved?

Any other comments:

Appendix 3

Photos showing how the room was used by students during the café



Appendix 4

Breakdown of topic areas that students requested help with

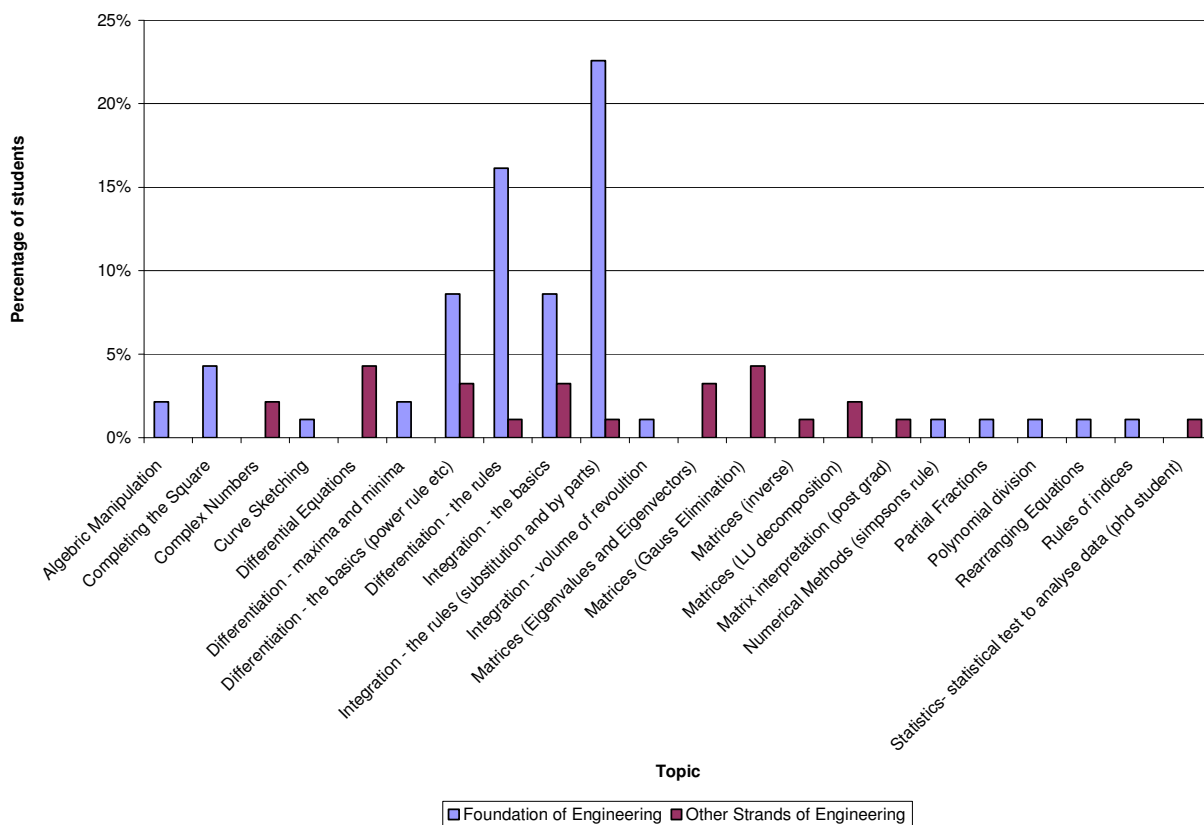
Category	Topic	Percentage of Students
Algebra	Algebraic manipulation (i.e. multiplication, addition, subtraction of polynomials)	14%
	Binomial expansion	3%
	Completing the square	14%
	Curve sketching	3%
	Factorisation of quadratics	10%
	Partial fractions	7%
	Polynomial division	3%
	Rearranging equations	3%
	Rules of indices	3%
	Rules of logarithms	3%
Calculus	Differential equations	9%
	Differentiation – maxima and minima	5%
	Differentiation – the basics (i.e. power rule)	12%
	Differentiation – the rules	19%
	Integration – the basics	11%
	Integration – the rules	25%
	Integration – volume of revolution	1%
	Partial Differentiation	1%
	Partial Differentiation (constrained optimisation)	7%
	Partial Differentiation (unconstrained optimisation)	9%
Linear Algebra	Numerical Methods (i.e. Simpson's rule etc)	2%
	Eigenvalues and eigenvectors	18%
	Gauss elimination	18%
	Inverse matrices	41%
	LU decomposition	18%
Statistics	Matrix interpretation	5%
	Probability	9%
	Permutations and combinations	9%
	Statistics	36%
	Statistics for economists	36%
Other	Statistical tests for data analysis	9%
	Algebraic formulation (post grad)	7%
	Complex numbers	10%
	Discrete maths	10%
	Fourier Series	2%
	Graph theory	7%
	Help with assignment	63%

Appendix 5

The tables and graphs below show the topics students required one-to-one support with, broken down into Schools. Within each School breakdown, the key courses that students were from (such as Foundation of Engineering) have been split from the other strands of courses from the same Schools. This detailed analysis will be more helpful when looking into mechanisms that can be incorporated into these key courses over the next academic year.

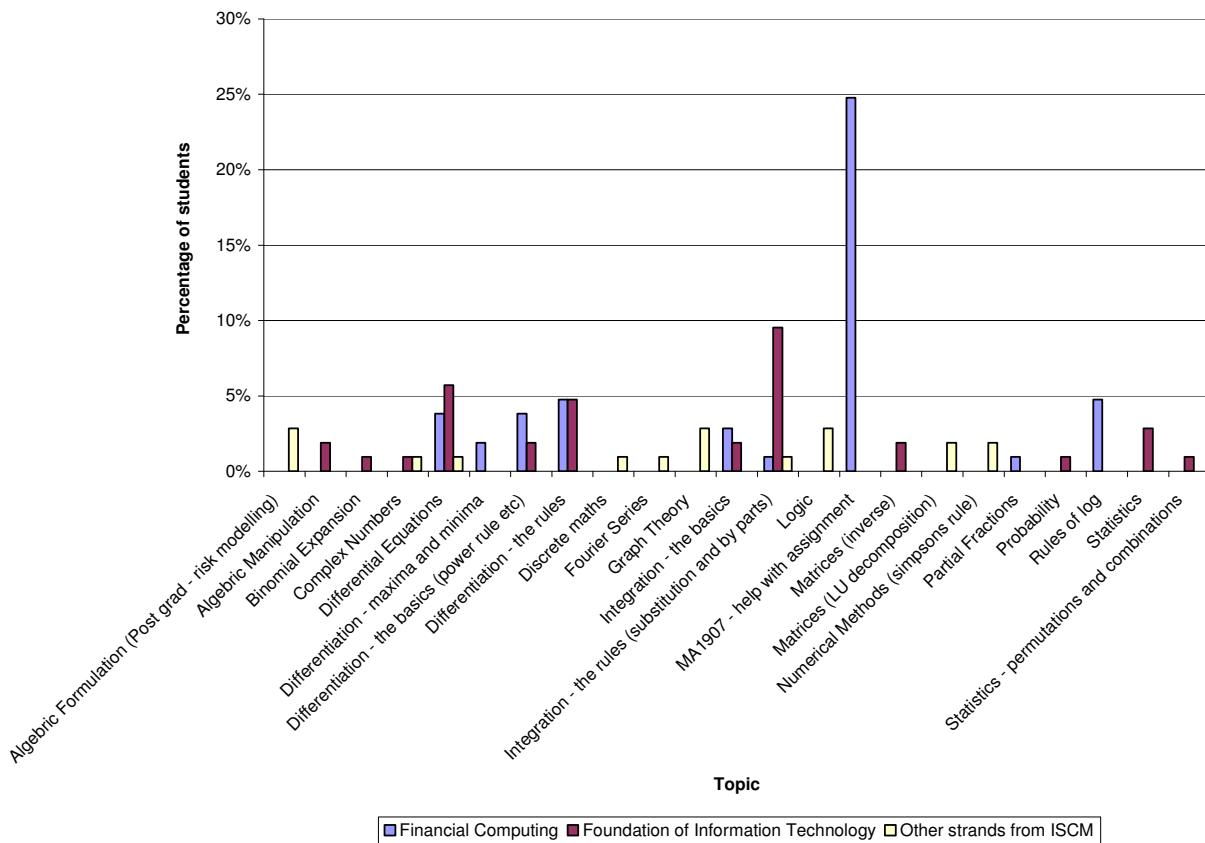
- Engineering and Design

Topic	Percentage of students from the School of Engineering & Design that requested help with each topic	
	Foundation of Engineering	Other Strands of Engineering
Algebraic Manipulation	2%	
Completing the Square	4%	
Complex Numbers		2%
Curve Sketching	1%	
Differential Equations		4%
Differentiation – Maxima and Minima	2%	
Differentiation – the basics	9%	3%
Differentiation – the rules	16%	1%
Integration – the basics	9%	3%
Integration – the rules	23%	1%
Integration – volume of revolution	1%	
Matrices (Eigenvalues and Eigenvectors)		3%
Matrices (Gauss elimination)		4%
Matrices (inverse)		1%
Matrices (LU decomposition)		2%
Matrix Interpretation – postgraduate		1%
Numerical Methods (Simpsons rule)	1%	
Partial Fractions	1%	
Polynomial division	1%	
Rearranging Equations	1%	
Rules of Indices	1%	
Statistics (Statistical test to analyse data – PhD student)		1%



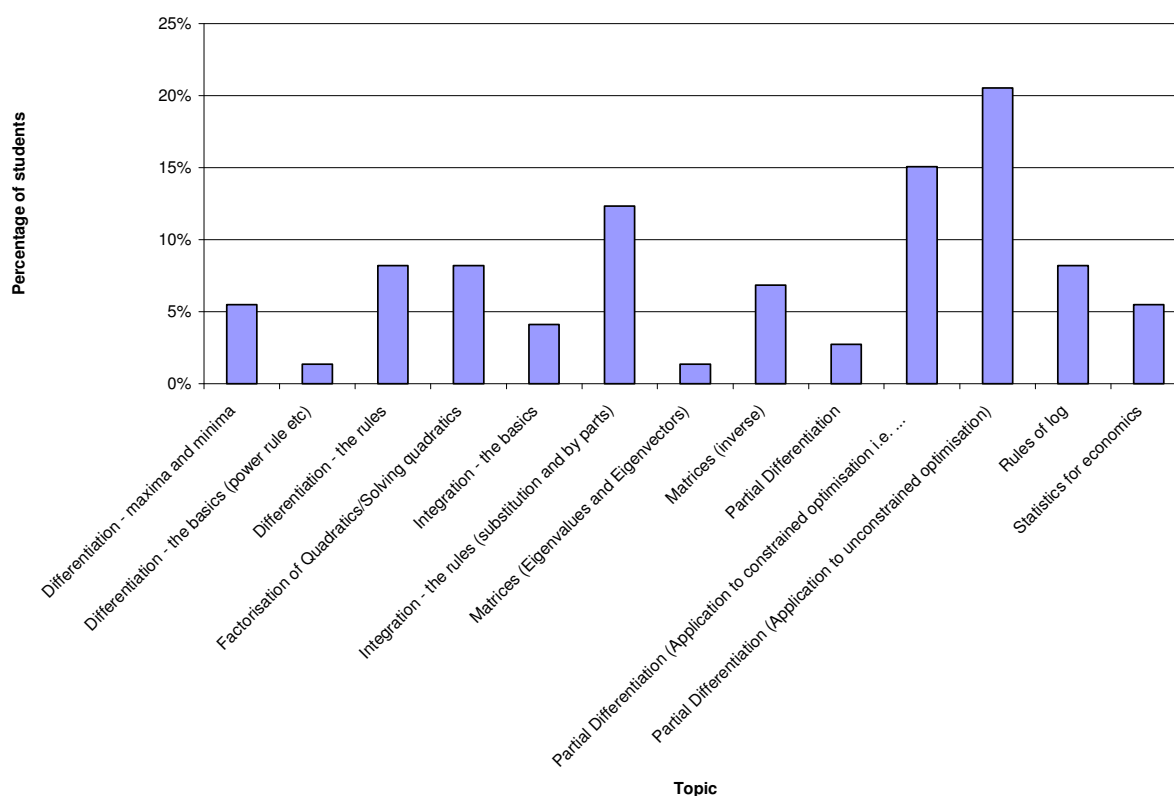
- Information Systems, Computing and Mathematics

Topic	Percentage of students from the School of Information Systems, Computing and Mathematics that requested help with each topic		
	Financial Computing	Foundation of Information Technology	Other Strands of Engineering
Algebraic Formulation (Postgraduate – risk modelling)			3%
Algebraic Manipulation		2%	
Binomial Expansion		1%	
Complex Numbers		1%	1%
Differential Equations	4%	6%	1%
Differentiation – Maxima and Minima	2%		
Differentiation – the basics	4%	2%	
Differentiation – the rules	5%	5%	
Discrete Maths			1%
Fourier Series			1%
Graph Theory			3%
Integration – the basics	3%	2%	
Integration – the rules	1%	10%	1%
Logic			3%
Matrices (inverse)		2%	
Matrices (LU decomposition)			2%
Numerical Methods (Simpsons rule)			2%
Partial Fractions	1%		
Probability		1%	
Rules of log	5%		
Statistics		3%	
Statistics – permutations and combinations		1%	
Assignment Help	25%		



▪ Social Sciences

Topic	Percentage of students from the School of Social Sciences that requested help with each topic	
	Foundation of Engineering	Other Strands of Engineering
Differentiation – Maxima and Minima		5%
Differentiation – the basics		1%
Differentiation – the rules		8%
Factorisation of Quadratics/Solving quadratics		8%
Integration – the basics		4%
Integration – the rules		12%
Matrices (Eigenvalues and Eigenvectors)		1%
Matrices (inverse)		7%
Partial Differentiation		3%
Partial Differentiation (Application to constrained optimisation)		15%
Partial Differentiation (Application to unconstrained optimisation)		21%
Rules of log		8%
Statistics for economics		5%



Appendix 6

Comments received from students from the feedback forms:

- Thank you for your help
- Thank you
- Fantastic
- Thank you for your support
- Grateful for help provided
- It is good
- Too good – no need for improvements
- Was good, Mundeep is fabulous
- Very good
- Very useful
- Explanations given were very good
- The staff were very helpful
- Very good tutors
- Very good teaching skills
- Very knowledgeable and understandable teachers
- Mundeep is great, she helped me to understand everything
- The lady was very helpful
- Quick to see a tutor
- I was amazed of the level of support that was given to me. Really pleased. Thanks
- The café is very useful for students as it gives them the chance of 1 on 1 tutoring.
- I expect more help next year.
- Friendly and helpful.
- Very good, loving the free food and drinks.