
After the diagnostic test – what next ?

Evaluating and Enhancing the Effectiveness of Mathematics Support Centres – Part 2.

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In the face of the well-documented decline (see for example, [1-3]) in the level of mathematical skills displayed by students on entry to university, many higher education institutions have established some form of mathematics support centre. These centres offer learning support to students which is in addition to that provided by their routine teaching programme of lectures, tutorials, problems classes, etc. Often the provision is primarily aimed at those who are not specialist mathematicians although specialist mathematicians are rarely barred from using the provision.

In 2001 a grant was received from the LTSN Maths, Stats & OR Network to fund a project to investigate how widespread is this kind of learning support provision, to identify elements of good practice in this provision and to disseminate these findings throughout the higher education mathematics community.

The project began with an email and on-line survey to discover the extent and nature of mathematics support centre provision. This was followed by a number of telephone interviews to establish more details about provision at certain universities and finally seven centres were visited to gain first-hand insight into the way they operate. During these visits students as well as staff were interviewed to try to determine the student perception of the mathematics support centre.

The findings of the questionnaire were reported in a previous issue of *MSOR Connections* [4]. Whilst it is not appropriate to duplicate the details of that article it is worth noting that of 95 institutions replying to the survey 46 indicated that they had some kind of mathematics support centre provision whilst 49 said they did not. The key element of this provision which was identified most often by the respondents to the questionnaire was the one-to-one support which is made available.

In this article we will report on the information gained through site visits to mathematics support centres focusing particularly on the views of students as expressed in individual and small group interviews.

Institutions Visited

The following mathematics support centres were visited:

- Mathematics Support Centre, Coventry University
- Maths Help, University of Edinburgh
- Open Learning Resource Centre, University of Huddersfield
- Mathematics Learning Support Centre, Loughborough University
- Maths Plus, Napier University
- Maths Help, Sheffield Hallam University
- Core Skills Unit, South Bank University

These institutions were chosen as it was clear from the responses to the survey that they gave a broad cross-section of provision. Some of these centres are situated in the mathematics department, some in the library and one in a central support unit. Staff from all institutions and students from all except Napier University were interviewed to determine their opinions about the mathematics support provision. In total 58 students, who used the provision at their institution, were interviewed. In addition, at two institutions, students



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who had not used the mathematics support centre were also interviewed.

Views of Centre Users

No attempt was made to randomly sample centre users. The students who were interviewed were those who came to a particular centre whilst the visit to that centre was taking place. The 58 interviewed therefore includes 2 students who were making their first visit to the mathematics support centre.

1. General Issues: A summary of the student responses is given in the tables below.

Were you adequately prepared for the mathematics in your course?			
Yes	64%	No	36%

Table 1(a) Preparation

What is the attitude of teaching staff to problems with mathematics?	
Helpful	48%
Not all approachable	26%
Too busy	17%
Helpful, but would not go to their office	5%
Don't Know	3%

Table 1(b) Teaching Staff Attitude

What is the attitude of mathematics centre staff to problems with mathematics?	
Helpful	86%
Not all helpful	9%
Don't Know	3%
Cannot always answer question	2%

Table 1(c) Mathematics Centre Staff Attitude

Does the location of the centre suit you?			
Yes	100%	No	0%

Table 1(d) Location

Do the opening times suit you?			
Yes	69%	No	31%

Table 1(e) Opening Times

At many institutions, one of the motivations for establishing a mathematics support centre is that many

students are not adequately prepared for the mathematical or quantitative elements of their course. This is not a perception shared by the students who were interviewed, with only marginally more than one third feeling inadequately prepared.

It is of some concern that less than half the students interviewed regarded mathematics teaching staff as helpful. As would be expected a much greater proportion found the staff in the mathematics support centre helpful. The 3% who replied 'Don't Know' about the attitude of centre staff were the 2 students making their first visit to the mathematics centre.

The fact that no students complained about the location of the centres is encouraging, given that the seven centres visited were situated in a variety of locations. However, this response cannot be taken as representative of the student body as a whole as those students (if any) who had been deterred from attending the centre because of its location were not present to be interviewed.

The 31% who complained about the opening hours were split between those who wanted longer opening hours and those who wanted more variety in the timetable.

2. Good Points: In addition to the reasonably closed questions covered above the students were also asked to list what they saw as the good and bad points of their mathematics support centre. The percentages in the tables below sum to more than 100 as many students gave a number of replies to these questions. As the students expressed themselves differently their responses have been grouped together into categories covering the main thrust of their points.

Good Point	%
1:1/tutor	88
Time/availability	38
Atmosphere	29
Friends/peers	19
Resources	19
Extra help	17

Table 2 Good Points Identified by Students

The '1:1/tutor' category covers responses which focused on the attributes of the staff (for example, 'The staff are patient' and 'You can ask them about anything') and the individual nature of the help received (for example, 'With one-to-one help you can get to the bottom of the problem').

The 'Time/availability' category covers comments concerning the fact that help was available at known times and that an individual could come for help at times that were convenient for that individual.

The 'Atmosphere' category covers both the physical attributes of the centre (for example, 'pleasant environment' and 'convenient spot') and the less tangible ethos of the centre (for example, 'You feel that this is the right place to go for help' and 'It's OK to take an hour to understand'). Some of these latter replies are closely linked to the staff attributes covered by the category '1:1/tutor'.

The 'Friends/peers' category relates to the centre being a place where it is possible to work with friends and other class members. For some this provided a motivational aspect ('If I stayed at home I wouldn't do anything. If I come here I see everyone working so it makes me work.').

The 'Resources' category includes comments about any resource other than the staff and the room itself. The overwhelming majority of these responses referred to handouts.

The 'Extra help' category covers responses which related to the availability of any support in addition to the normal teaching programme (for example, 'That it exists at all' and 'Not a lot of other places to go for help').

It is interesting to compare the students' perceptions of the good points of mathematics support centres with those expressed by staff when completing the questionnaires.

Good Point	Student %	Staff %
1:1/tutor	88	69
Time/availability	38	12
Atmosphere	29	52
Friends/peers	19	0
Resources	19	12
Extra help	17	10

Table 3 Comparison of Student and Staff Perceptions

At first sight there appears to be a large difference between staff and student perceptions. However, both groups view the provision of 1:1 assistance by a helpful tutor as by far the most important feature of the centre. Although no staff responses specifically mentioned the fact that the centre was somewhere for students to work with their friends, this may be implicit in some of the staff comments about the relaxed and informal atmosphere

of the centre. If the 'Atmosphere' and 'Friends' categories are combined there is better agreement between the two groups. Generally the percentage of staff mentioning a particular feature is lower than the percentage of students. This may be because the questionnaire phrased the enquiry slightly differently, asking staff to identify up to three things their centre does well, particularly where these may not be widespread in higher education. Some staff may not have listed features that they think are valuable because they are features of all mathematics support centres.

3. Bad Points: As with the good points the responses have been grouped in categories covering similar themes. These categories have been labeled according to how the perceived bad point could be remedied.

Bad Point	%
More 1:1	71
More resources	55
Better room	21
Better publicity	12
Better staff	9
Better location	7
Overcome student attitudes	5

Table 4 Bad Points Identified by Students

The categories are all fairly self-explanatory. The value to students of the 1:1 contact with staff is further reinforced by this data. The comments here mainly related to the fact that the centres can be busy at certain times and then students have to wait for a considerable time to receive 1:1 help. The high desire for more resources is perhaps a little surprising as the evidence of Table 2 suggests that not many students visited the mathematics centre for the resources. The small number of students wanting better staff ('More good teachers') corresponds to those who found not all centre staff helpful (see Table 1(c)). Although only a small number of students highlighted the need to overcome student attitudes the comments made are revealing: 'Students don't like to admit they need help' and 'Students don't like work'!

Views of Non-Users

22 students who had not used the mathematics support centre at their institution were interviewed. However, these students were from only two different institutions where the centres operate on similar lines. Therefore, care should be taken in interpreting their responses and applying them to other contexts.

Were you adequately prepared for the mathematics in your course?			
Yes	50%	No	50%

Table 5(a) Preparation

What is the attitude of teaching staff to problems with mathematics?	
Helpful	59%
Not all approachable	14%
Too busy	14%
Assume students have a better background	9%
Don't Know	5%

Table 5(b) Teaching Staff Attitude

Does the location of the centre suit you?			
Yes	77%	No	23%

Table 5(c) Location

Do the opening times suit you?			
Yes	82%	No	18%

Table 5(d) Opening Times

It is surprising to note that half of the non-users interviewed (compared to a third of users) felt that they were not adequately prepared for the mathematical elements of their course. The fact that these students did not seek help from the mathematics support centre is only partially explained by the fact that a higher percentage of them (compared to centre users), 59% against 48%, found mathematics teaching staff to be helpful.

The key points to emerge from the discussions about the reasons these students did not use the centre relate to publicity (two-thirds of them claimed to have heard little or nothing of the centre) and to the location. However, some students were unrealistic on this latter point wanting the mathematics support centre to be in their own block (14%), with others (9%) being more reasonable in suggesting a central location such as the library.

Conclusions

As part of a LTSN Maths, Stats & OR Network funded project into the effectiveness of mathematics support centres in higher education institutes, students at a number of universities with such centres have been interviewed. The findings of these interviews are that many students value their mathematics support centre, particularly because it provides them with the opportunity to receive one-to-one assistance from a

sympathetic tutor who is willing to take time to explain things to them. Furthermore, students also value highly being able to use the centre at times which are convenient for them rather than at times which are determined for them.

A handbook *Good Practice in the Provision of Mathematics Support Centres* [5] which has been informed by the findings of this project is available from the Maths, Stats & OR Network.

References

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