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Curriculum, Evaluation
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Education Evaluation Group

Evaluation of the MEI Further Mathematics Network

Initial Report

September 2006

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1. Introduction

As part of its pilot initiative to encourage more sixth form students to study Further Mathematics at AS/A2 level, MEI has developed an infrastructure to support the teaching and learning of Further Mathematics. This consists of local delivery centres, support materials (mostly on-line) and central support. The infrastructure is designed to enable students to study Further Mathematics even when the schools/colleges they are attending cannot offer a Further Mathematics course themselves.

This pilot has now been taken up by the DfES and a national ‘Further Mathematics Network’ of regional Further Mathematics Centres will now become part of the national provision. The Network is funded by DfES and its set-up is being managed by MEI. Ultimately the Network will cover the whole of England, with roughly one Centre for each of the 47 local Learning and Skills Council (LSC) areas. The first of these regional Further Mathematics Centres have evolved from the ‘Lead Centres’ that were set up as part of the original MEI Further Mathematics pilot project (2000-2005).

The initial setting up of these Further Mathematics Centres began in 2005. In order to examine the progress of setting up of centres, the CEM Centre, Durham University, was asked to carry out an initial evaluation of the Further Mathematics Network. The main aim of this evaluation is formative in nature, to ascertain how Centre Managers are dealing with the setting up process, and the difficulties they are experiencing. As a result, we hope to identify any possible further support that will help them in managing the development of their Centres in the future and help those managers who are setting up new Centres.

For the purposes of the evaluation, the MEI Further Mathematics Network Management Team identified 24 Centres as being “up and running” at this initial stage. That is the Centres were operating as established Further Mathematics Centres within the proposed MEI Network, during 2005/06. For the evaluation, telephone interviews were conducted with the Centre Managers of these 24 Centres. These interviews followed a common format, as agreed with MEI. The interviews were designed to cover five aspects of setting up a Further Mathematics Centre:

1. The geographical region covered by the Centre
2. The initial launch of the Centre within the region
3. The support being provided by the Centre for students
4. The support available to the manager in running the Centre
5. Development of the Centre over the next three years.

Appendix 1 provides a detailed copy of the interview proforma used in the evaluation. The proforma provided a structure for the interviews but the interviews were semi-structured in nature. Centre Managers were encouraged to talk about their Centre and its management around the proforma questions, bringing in any points they wished to raise. In addition to the 24 Centres involved in this main part of the study, three other Centres were also initially contacted in order to trial and refine the proforma.

In this report, we summarise the findings obtained from the 24 interviews carried out in the main part of the study. In providing a summary, we have collected together the emerging issues and themes, guided in part by the way that the interview proforma was structured. Therefore, we will examine the following issues that emerged from the study:

- Diverse nature of the Further Mathematics Centres
- Contacts and the time and distances involved in visiting schools.
- The role of the Further Mathematics Centre and Centre Manager.
- Other stakeholders.
- Who should be taught where, and by whom?
- Numbers of students - Registration and Enrolment.
- Funding, finance and administration.
- Initial training, local networks and FM Centre Managers working together.
- The future and concerns.

The summaries are illustrated by quotations from the interviews with the Centre Managers.

We conclude the report by highlighting particular points to consider for the future development of the Further Mathematics Network.

2. Emerging issues and themes

(a) Diverse nature of the Further Mathematics Centres

The 24 Centres geographically cover most of England from Devon in the South West to Northumberland in the North. They include Centres based in cities covering a compact but densely populated area, to large shire counties where the population is much more widely spread. The Centres themselves are clearly much more of a concept than a physical place; the physical location of the manager often differs from the location of any meeting place for students, the latter often being flexible and transient in anyone region.

(b) Contacts and the time and distances involved in visiting schools.

All managers have highlighted the importance of visiting schools personally to develop contacts, and explain the concept of the Further Mathematics Network to a Head Teacher and/or Head of Mathematics Department.

“Some schools who I have sent letters, e mails and phoned up and said I wanted to talk to the Head, when I eventually got to meet them face to face, say crikey, why didn't someone tell us about the Centre earlier, and you say – I have been trying...it emphasises some of the problems you are trying to deal with; getting in touch with these people is harder than it should be. Often the teachers are sold; they just worry about selling it to management.”

Many managers noted the lack of response to letters sent out, phone calls not returned or e-mails not responded to. There was often a feeling that they just needed to reach the right person and some development would take place, as opposed to initial letters just being ignored by a particular school or college.

“One of the big problems is getting the message through to schools. One of the teachers I spoke to said she had actually thrown her invitation in the bin because she thought to herself we don't do further maths here, so I don't have to worry about it.”

Many managers noted that the attitude of the Head of Mathematics and/or the Head Teacher to the concept of the Further Mathematics Network was crucial. Where these people supported the concept and were cooperative in terms of timetabling and releasing pupils, it works well. Some schools however were said to be protective of their students and feared losing them.

“We have had one or two frosty replies from schools who I believe misunderstand the purpose of the Centre and think somehow we are trying to poach their students. ...I expect all schools in the region to be registered with the Centre. ... if they can see we are putting on quality revision events which their students can attend, I'm hoping that this will eat through the barriers”

“We do find that some of the schools who don't offer Further Maths, or have very small A-level groups, get quite defensive when they think we have taken their students. I have to tread very carefully; it is better to contact people direct and speak to them rather than blanket e mail everybody. You have got to find where the need is, rather than offering it to everyone.”

Some schools reported losing “good students” to a sixth form college or grammar school in the area, where further mathematics was established as a viable course. Many managers said they were aware of schools and colleges that were not involved in the network and there had effectively been no contact.

However, all managers have clearly put considerable effort into publicising their Centre, and most had a formal launch event to which all schools and colleges within a region were invited. Most of these events were said to be successful, but numbers attending and who the people were varied considerably from Centre to Centre. In general people attending a launch event may have included Heads of Mathematics departments and other mathematics teachers, a representative from the local authority, and a representative from a local university mathematics department. Attempts to get the launch of a Centre reported in the local media were generally not successful, although some managers said an article had been published in their local newspaper. It appears that mathematics is not very news worthy.

As well as establishing contacts, many managers made repeated visits to schools to tutor pupils and needed to fit in with a school’s timetabling arrangements to do so. Many managers cited travel time as a problem, some reporting journeys of up to two hours duration. This was either due to geographical distance in large shire county areas or volume of traffic in more urban areas. An issue that arises here is should the students come to the Centre or to a central place to be taught together, or should the tutor go to where the students are in their schools. Both are happening, and in some cases with more flexibility, in that students from two or three schools will meet in one place and the tutor will go there. This idea of hubs, or satellites, is one many managers will pursue.

“I am wrestling with the best way to move forward on taking on different students next year; should we be looking to tutors who are based in strong maths schools currently to deliver the tuition in their area, or should we be looking for a free ranger who travels from place to place? I think the latter option is cheaper but I don’t think it is particularly strong in promoting further maths regionally.”

“I would like to get key tutors based locally in schools in the region. This is vision I would like to see realised because if the tutors are actually based within the community that they serve, then it is far less intimidating to people to actually take on learning how to take on the teaching of further maths and it strengthens the bonds between schools locally.”

“The fact that it is an LEA based Centre means that the schools have different timetable slots and different module requirements. So it is difficult to try and pull them altogether; there is a lot of distance in travelling between the schools”.

(c)The role of the Further Mathematics Centre and Centre Manager

There is one outstanding similarity between the Centres and that is in the commitment of the managers. These people are enthusiastic and dedicated to what they are trying to achieve and often devote more time to their role than their contractual commitment. All the same, many managers have reported inadequate time to do the job the way they want to. Generally the activities they are involved in go from trying to increase the number of students taking up further mathematics, to encouraging students from primary age upwards that mathematic is an area of study worthy of their consideration and indeed their involvement after age 16. All the Centre Managers we interviewed are involved in some way in organising enrichment days.

Although it has not always been clear just what these days involve, it is clear that encouraging a view of mathematics beyond the classroom with years 10 and 11 pupils, and enthusing them about mathematics, is seen as a key activity of the Centres. Similarly the managers are involved in the organisation and delivery of Revision Days. Again, it has not always been clear just what is being revised, but it is clearly more than just further mathematics modules as reference has often been made to the pure mathematics core (C1, C2, C3 C4) and the applications options of decision, mechanics and statistics. The revision has also been about A-level mathematics in general and not just the MEI courses.

A Centre Manager emerges as having many roles, the prime one of which is acting as a catalyst to increase the take up of advanced level mathematics in their region. This involves them being both a facilitator and an organiser, as well as actually being a teacher. The initial concept of a Further Mathematics Centre, as we understood it for purposes of this evaluation, was a place where sixth form students could come to meet together with a tutor and study further mathematics, who otherwise would not be able to do so because it was not a viable option in their own school. Although this is undoubtedly part of the role, there seems to be far more to it than this. In particular, a key part of the role is in promoting, enhancing, supporting and enthusing about all things mathematics. In addition, it is about getting involved in or initiating/stimulating local action to interest more young people in mathematics, and to get them to consider mathematics as an A-level option and beyond that to higher education.

“I like to use the university side of things to go in and show them (year 10 onwards) bits of maths that they will never come across in their school and say there is a lot more stuff out there than just your text books. We are having a new lecture hall built here at the University so that should be all posh and swanky and will possibly encourage them.... Charlie says you have to be a maths evangelist, so I try and take that to heart.”

“I said to the schools the future is presently in years 10 and 11, so I'd do a presentation to the top year 10 and 11 maths sets and we could do a little bit of maths and I could do a little of publicity to show them how valuable a subject it is to follow on.”

(d) Other stakeholders

The role of the Management Committee

All Centres are expected to have a Management Committee comprising of people closely related with the Centre, including a representative from the MEI Further Mathematics Team. The interviews indicated that whereas some Centres have well established committees that are meeting regularly, there are others where the committee hardly exists.

“I think the meetings are almost isolated events. We have quite fruitful discussion, but then nothing happens until the next meeting apart from the things I am acting upon. ...it might be unrealistic to expect people to do more because they have been press ganged on anyway.”

“We don't have one and I haven't really pushed the issue; we have an unofficial network of support”

Centre Managers are clearly looking for support from their Management Committee. Several managers emphasised that they want proactive members in terms of ideas, contacts and practical assistance, and not just a group to report back to.

“I think this is vital, because I really need support and help in devising policies and strategies for going ahead”

“The Management Committee is excellent; they are very supportive; they listen and they offer suggestions. It is comforting for me to know there is a body like that behind me to say look I’ve run this past you, you think it is OK so right I’m going to go ahead and do it.”

“It never got off the ground, but it is going to be re-launched. I have found that you do need the support of a management committee and it is very important that it provides support and information.”

Some managers were rather vague as to just who is actually a member of their Committee or is involved in some way, although it seems desirable to have representatives of the following involved: the local education authority, probably a mathematics advisor or consultant; the local university, probably someone from the mathematics department or associated with mathematics education in some way; Head Teachers(s) and Head(s) of the Mathematics Department from local schools. Other possible membership includes further mathematics students and people from local businesses.

Enrichment and university involvement

As mentioned above, all managers talked about enrichment days, or days of mathematical activity, involving challenges and problem solving particularly aimed at years 10 and 11, but some mentioning gifted and talented children as young as primary age. Similar events have been arranged for year 12, with activities for them and year 13 more orientated towards revision and preparation for examinations. The involvement of a local university in these events has been notable, either through the mathematics department and/or the mathematics aspect of the education department or the university has had someone responsible for schools liaison. This seems to work in two ways. Firstly, young school students are impressed by visiting a university and being taught by university staff; secondly the universities are concerned as to their own future supply of undergraduates and are keen to take up the opportunity to promote the subject and their facilities.

“The local university have been very, very helpful. They did provide accommodation for us and have offered it for future use. They are a new university so they do need all the good publicity they can get, so it’s a mutual thing really.”

“It is nice to get them into the university but if it causes problems then we need to be flexible and go to them rather than them come to us if necessary.”

“I have got a very supportive Head here at the university and we have got a very supportive set of schools that we work with and it has been a pleasure to do it.”

It is notable that not all Centres have a local university. Some have responded to this by assisting travel to the nearest one to attend such an event, but some areas of the country seem to be missing out on this opportunity.

Involvement of the Local Education Authority

The involvement of the LEA has varied considerably between Centres, but there does seem less involvement from LEA personnel than there is from universities. In some LEAs, the Centre Manager has found it difficult to identify who has responsibility for mathematics. In some Centres, an LEA mathematics advisor or consultant has become involved and may be a member of the Management Committee, although it seems in some LEAs that advisors and consultants see their primary role as pre 16 and not involved with A-level. Some LEAs have seemingly been disinterested in the Centre and not offered any support.

“A lot of these advisors say their work only goes up to age sixteen; certainly that has been my experience”

“I would like the LEA to be more involved; the LEA are very reluctant and don't seem interested in promoting us”

(e) Who should be taught where, and by whom?

Many managers, in reporting on the provision for further mathematics in their region, reported schools where the number of students taking it was very small, often just one or two. The fact that such students were able to take further mathematics was often down to the commitment of a particular member of staff, willing to teach after school or in a lunch period. Such teachers, in fact, regard the opportunity to teach some further mathematics as a 'perk' of their job and would be reluctant to lose it. This creates a dilemma for some managers, in respecting the position and wishes of such teachers against the best interest of the students.

“Others would have one or two where they would see someone for an hour at perhaps lunchtime,...but they are very defensive and they love further maths and they don't want to lose it and I would be the last person to say that I'm going to take it away from you in any shape or form.....I feel it is important to work with the schools and colleges and not be seen as wanting to take further maths from them.”

“We have a very high calibre of mathematics teachers and they generally prefer to do it themselves, even if means teaching one or two students in the evening; they hang on to them rather than cry out for us to do them.”

A related issue is that a number of these committed teachers are nearing retirement age. The question was often raised about what will happen to further mathematics after they are gone. Interestingly, some may become Centre tutors, as some managers said they were already employing retired teachers to do some tutorial work. Some managers reported concern over finding suitable tutors; those who can teach at the right level. Some raised the issue of university staff as tutors, as presenting material over the students' heads or being patronising to them. Managers want to find tutors who can both support and challenge the students.

What is emerging in many areas is localised consortium arrangements, whereby several schools with at least one student who wants to do some further mathematics form a consortium. The teaching is done partly by staff from the schools, with the manager or their appointed tutor teaching topics and/or modules that the teachers feel unable to do themselves.

“We want to open up new gateways; we’ve had a request for an informal study day to bring together a number of local schools and get the students to interact. So even if we are not tutoring them we might be able to get students together which they wouldn’t normally do.”

“It is all dependent on teacher goodwill rather than actually being structured; I have come across schools that because the numbers have dwindled management say it is not financially viable; it is schools that are desperate to get back into it again – they view the Centre as a way of achieving that.”

“Further maths is being taught in house but not necessarily in curriculum time, teachers are actually going out of their way to accommodate students who wish to do it. I have had several visits to schools where I have said if you want to, do make use of me and the FM website.”

This has led to problems of who is responsible for these students in terms of examination entry and reporting to parents. One suggestion from a manager is that there needs to be a school based mentor who is responsible for such things and for tracking the progress of each individual student.

“It is extremely important for the schools to have somebody who is really working with the students, so that they are not left on their own. When I look at the schools that have succeeded then it is because there is a teacher who has really been interested in what they are doing.”

Some managers reported concern over the degree of maturity required by students to make working through a Centre successful. They noted that if they are only seeing students once a week, it causes problems if non-attendance or lack of homework is an issue or if students simply drop out. It is suggested that students do need mentor support in developing responsibility for their own learning, making a commitment, and thus using the MEI distance learning resources effectively.

“I think that drop out is a significant problem...I am only seeing them once a week and there is a problem of communication during the week. They need to be self motivated and be prepared to be independent which is something they are just learning at that age (16/17). Really it depends on the motivation and study skills of the individual students.... I need to have a properly designated contact within the school ... it’s coordination of the students time that is the factor.”

“I have had difficulty trying to teach the syllabus on a restricted timetable. When you get the lower sixth form shift in attitude it probably takes one year or so before they realise they have to do more themselves. When you see students once a week and they hand in homework if they then miss a week its harder to keep on top of what is going on because you are not there to remind them and push them.”

The variation in student attendance and what they are attending for has raised the question for some managers as to whether these students are enrolled at their Centre. Another question in this

area is where schools and colleges are able to run viable, some even thriving, sets of further mathematicians. Are their students eligible to attend the enrichment and revision events? Many managers reported that just them being around in their region, such as staff attending meetings of Heads of Mathematics with a LEA advisor, was raising the profile of further mathematics and some schools were putting it back on the curriculum as a result.

“The theory behind the FM network is that you create enthusiasm in the schools for Further Maths and at some stage you can say you have five or six people now so you can put it on and that’s the job done.”

“Talking to Heads of Schools I think the way forward is to put pressure on schools to teach Further Maths back on the timetable and to sell it far more to the students in the schools. I talked to some of the heads and they say that the numbers are going up within schools and they put it down to the profile of Further Maths has been raised having almost disappeared of the map.”

(f) Numbers of students - Registration and Enrolment

Many managers reported that they found it frustratingly difficult to get precise figures regarding the provision and take up of A-level mathematics and further mathematics in their region. Many expected this information to be available through the local authority, but it often was not. We note that such information must be available at school and college level, as it is a required part of census returns to the LSC, so question why it is difficult to get in any accurate aggregated form. Managers also seemed in doubt as to whether they should be considering the independent sector. Many managers did seem vague as to whether schools and colleges had registered or not, and more so as to how many students had enrolled at their Centre. Although many schools and colleges had sent pupils/students to enrichment and/or revision events, whether they were entitled to do this as a result of registration was not clear. Many managers reported large numbers (200+) attending these events, so in that respect they are certainly successful. Many students were requesting support on just one module and again it was not clear whether such students were enrolled. The number of students enrolled at a Centre (in the way we understand MEI to mean it; i.e. taking 3 AS further maths modules, or 3 A level further maths modules) is generally very small, often less than 10 and in some cases no students enrolled. However, most managers did note that they are in a state of development and they expect numbers to increase in the future. However, others were equally concerned that numbers would not increase and thus wondered what future there was for their Centre. A lot of these concerns focus on the matter of finance and funding.

(g) Funding, finance and administration

There appears to be a lot of confusion in schools over the funding arrangements for student studying within the Further Mathematics Network. Many managers thought schools reluctant to get involved because school managers thought there was a cost to their school involved. Many teachers seem unaware of how post-16 funding operates under the LSC. Many managers reported of bureaucratic nightmares in handling the funding, particularly those operating through universities.

“I am finding it difficult to get the message across to the hierarchy of schools and colleges that it won’t actually cost them anything to use the Centre.”

“I find dealing with the finance people at the College quite difficult; trying to get monthly returned finance documents signed is difficult.”

“It’s hard for people to understand the funding mechanism. Heads of Department and teachers are not aware of how schools get funded by the Learning Skills Council. We do try to emphasise that it doesn’t actually cost the schools anything...”

Many managers did put the view that really they wanted to teach, and the administration was a burden they had to cope with. However they were coming to terms with it, although many hoped for some administrative assistance next year.

“Time is a problem; it’s an important factor; when I hear what other Centres are getting up to, I don’t have that time. I have no administrative support and that is a concern.”

“The difficulties in setting up the Centre have been lack of time and administrative help, and also the funding. We feel that Centres that are based at universities get more access to support.”

“The time constraints can be difficult. I really get bogged down with the administration. I like doing all the teaching and I actually provide a lot of resources at the Centre which are actually adopted by the National Team. I prefer doing that than the administration but realise that it has to be done. It is a very time consuming job but it has brought its own rewards.”

“The database has been a rather tedious and time consuming activity and I don’t think I have totally filled it in to be quite honest. I think the way to address this is to buy in some admin time...I’ll pay someone in the school office an hour a week to keep the data base up to date.”

Virtually all highlighted and praised the assistance and support they got from MEI’s Trowbridge Office in matters of administration. All the same, many were not happy with this aspect of their role although they expected it to get better as they got more familiar with the role. One manager accused MEI of moving the goal posts, in that he said advice he got was not consistent from enquiry to enquiry. Another asked whether MEI really knew how a school works.

“I didn’t realise that there would be as much administration. In hindsight, MEI need to produce a check list with important dates etc, and some summary sheets, because I think afterwards (the training) although you cover all the areas you feel a little bit overwhelmed and then you go away and set up your Centre and write your articles and I think sort of working out yourself what to do next. If there was a bit more structure and a little bit more of summary of things you should be doing and when, I think that would be helpful.”

“Support from MEI has been second to none. Every time we have had a query we have always got an answer within 24 hours. We have been very impressed by the commitment and professionalism.... The only thing we would say is there is a certain amount of naivety from them on how schools actually work. One or two things have been said, and you think, God, would we ever get that done in a school....Apart from that it has been absolutely fantastic.”

(h) Initial training, local networks and FM Centre Managers working together

The initial training and support provided by MEI at the Trowbridge Office and in the field has been highly praised and is clearly valued by all managers.

“The initial training was most impressive. Everything was very useful but we both felt that we were completely overwhelmed. It was all wonderful stuff, but too much. I think at one point he was thinking he might not take the post on.”

“I have had a lot of training (from MEI) that I am not quite ready for yet; I have taught maths and administered maths programmes all my life but my role now is more of a spokesperson, but it’s a different kind of skill that needs to be developed. On the whole the training has been very good.”

However, some did describe the training in the administration as somewhat overwhelming, and they could not take it all in. However, the chance to meet with other Centre Managers and realise they all had the same sort of anxieties, problems and hopes was also valued. In some areas, this has developed into cooperating with each other in matters such as whose school is whose, and sharing resources such as a university facility for enrichment and revision. These managers have realised that they have all come into the job with different backgrounds and sharing their ideas and concerns has been very worthwhile. However, another manager put an alternative view, saying he felt that another planned Centre local to them threatened their existing Centre as they would lose students to it.

(i) The future and concerns

All the managers think that the project is very worthwhile and are committed to making it a success. A belief emerges from the interviews that there are many sixth form students “out there” who could benefit from studying further mathematics and are capable of doing so. Finding these students and involving them in the activities of a Centre, with or without the support of their school or college, is the problem. There does appear to be a perception of further mathematics as difficult, and students should only take it if they are “good at maths”. A common view apparently is that further maths is only worth taking if you are likely to get a grade A or B.

“They encourage it here (a sixth form college); I think it depends on what barriers they put in front of the students to allow them to do it. Here if they have an A grade in maths then they are automatically asked if they want to do further maths. In other places they require students to have a 6.5 GCSE average score; that would exclude people who would be allowed to do it here.”

“One of the things that has become a stumbling block for us is that students think if they are not going to get an A or B grade, then there is no point in doing it ...but they may only get a D or E grade, but they still benefit because they go off and do courses and they come back and they say it is so much better doing it at school.”

In contrast to this, a university lecturer said he believed that exposure to some of the mathematics, even if students are not particularly successful at the time, made it considerably easier to understand similar material on a degree course.

“I’m not convinced it’s the grade (in further maths) that matters but being exposed to the new material, so that if they go onto higher education they will have seen it before; they may not have fully understood it but next time around they will have a better chance of understanding it.”

Another aspect of this who should take further mathematics question is from the perspective of schools. Further mathematics does thrive in terms of numbers in many independent schools, grammar schools and some sixth form colleges. One manager reported coming across an arrogance problem of “we know how to teach further mathematics properly and the Network is of no interest to us”.

I am concerned that we have had a sort of reluctance; the grammar schools seem to want control; they feel as if they can’t do it themselves then it might not be done properly.... What I have to try and do now is get into those grammar schools and try and get them to do the same sort of thing – make further maths accessible to the less than brilliant mathematicians.”

Another raised the question as to whether there is a gender issue in further mathematics, i.e. are more boys than girls taking it?

Many managers have optimistic plans for the next 3 years, although these are qualified at least in some regions by a genuine worry that students will not come forward to enrol and thus the Centre will not become financially viable. They have raised the question as to what will happen if this is the case. Will their ambassador role cease with their Centre? One manager did comment that it seems an expensive way of getting “another half a dozen students” to take further mathematics.

“It’s really the financial justification for it, which is the concern that I have. How financially viable might all this actually be as far as it becoming self-supporting.”

“I can’t see us being financially self sufficient; I don’t think the numbers are out there. ...but I’m sure there are students out there capable of doing further maths; we just need to enthuse them.”

“I think the idea of being self-sufficient is going to be difficult. I can envisage more schools offering further maths, but I don’t think it will make a big difference; it will be a case of scratching the surface, and I don’t think there are hundreds of them out there.”

“I have awful trepidation about the third year and if we are actually going to get funding to cover our costs. I fully support the project and I think it is the most brilliant idea and I hope, hope, hope that we do get some funding for year four and hope it is not another project that has three years funding and then slowly, but surely, it fizzles out.”

On the other hand, many managers are concerned that student numbers will grow and that they will not find appropriate tutors, especially for some of the applications modules. Most managers themselves are at present the sole tutor or are assisted by another teacher. Many though are involving retired teachers who have the time and flexibility to meet needs, and some are using people associated with universities including lecturers, post graduates and trainee teachers. Many Heads of Department and other teachers have indicated a wish and a willingness to be involved, but there are severe restraints on their time.

“The new Centre Manager is a little bit worried about recruiting tutors as and when required. So if he suddenly has an explosion of interest, where exactly is he going to get these tutors from? “

“I see no limit to how much it can grow; people are suggesting all kinds of things and for next year that becomes impossible for us to do.”

3. Points to consider in the future

Through examining the emerging issues and themes in the previous section, we conclude this report by raising points of consideration regarding the future of the Further Mathematics Network. We hope that examining and clarifying these points will provide the formative outcome which was the aim of this evaluation. We are aware that guidance on some of the issues and queries raised here is available to the Centre Managers through the MEI Further Mathematics Network, website. All managers have access to the Managers Area on the site. However, it appears to be the case that not all managers are aware of this, or cannot find the time to look for the answer to their particular question or query on the website.

- **Registration and Enrolment**

The first point to clarify is what it means for a school to be registered and for a student to be enrolled at a Centre. Are schools/colleges registered only if they have completed a document? Many send students to revision days and enrichment events without apparently being registered, and it needs to be clarified for Centre Managers whether this is a problem. In addition, many students are taking one or two modules under the auspices of a Centre, rather than the three modules for AS or A2. They make take one module with the Centre and two with their school or college or various other combinations. Should these students be considered as enrolled, and what are the funding implications of whether they are or not?

- **Management Committee**

Is the composition, role and expected frequency of meeting of a management committee made clear to Centre Managers? There seemed to be much variation in the make up and activities of the management committees.

- **Administrative Support**

Lack of time was a common complaint by Centre Managers, wanting more time to visit schools and colleges and time to teach. Administration was seen by many as a necessary burden. Many managers reported issues of financial control, when required to manage all financial matters through their fund holder. The question was therefore raised as to whether more assistance for administration could be funded. This issue seemed easier for Centres that were University based, but not universally so.

- **What is a Centre and a teaching group?**

In many regions, there is a location for the Centre Manager, but the region itself consists of any number of small groups. These were variously called consortia, hubs, satellites, clusters or sub-centres, and managers referred to working with ‘teaching groups’ or ‘tutorial groups’. An issue to consider, perhaps for Centre Managers themselves, is whether there is a distinction between these? Also, is there a minimum number of students for a viable teaching group, say 10, or is there in maximum number of students for a tutorial group, say 5? Is it preferable to keep students in small numbers in their schools or encourage a social mix through meeting

elsewhere? It will be interesting to see whether general guidance can be developed regarding these issues.

- **Progress Tracking and Pastoral Care**

Issues regarding the tracking of pupil/student progress were raised by managers during the interviews. For example, who is responsible for tracking the progress of a student and reporting back to their personal tutor and parents? Who should take responsibility for non-attendance or failure to submit work? As a result, should each student enrolled at a Centre have a named mentor at their school/college who adopts this role? The need for students to possess a certain maturity, responsibility and commitment to the course has been noted by many managers. Once again, who should counsel students in such matters?

- **Viability and Self Financing**

Many managers raised a concern about the possibility of their Centre not becoming self-financing through an inability to attract sufficient students. Some have asked if this is a three-year project. A related concern is whether there will be situations where Centres are competing for students across borders? Some reassurance as to likely longer-term development of Centres seems to be required.

- **Role of the Independent Sector and of Further Education**

Most of the managers indicated that they had not considered the independent sector and any role that they might play in the development of their Centre. Should this be an area that they do consider? Similarly, apart from Sixth Form Colleges, most managers have focussed on schools and not considered provision in Further Education Colleges. Should this be another area that they consider?

- **Technology and Solving the Distance/Time Problem**

Many of the managers have considered video conferencing as a solution to being able to “meet” with a group of students at the same time who are geographically diversely spread. However, it seems that there is little actual experience of using video conferencing and difficulties are anticipated. Relatively fewer have mentioned the audio conferencing facility Elluminate. However, many managers have stressed the advantages of working face to face with students. Some advice and guidelines on these matters would be helpful for managers. Given below are some comments from managers:

“I’d like to emphasise what an excellent resource the distance learning website is. A good number of students have their own access. Those that do use it speak highly of it.”

“E mail support has rarely been taken up, but has anyone mentioned “Elluminate” audio conferencing? When we first looked at this we talked about video conferencing as a support system, but this piece of software has a facility whereby both tutor and student can concentrate on the written maths.”

“ I don’t really like video conferencing, but if numbers rise we may have to go down that route; we have dabbled with it but it needs more work to get it up and running smoothly; it is preferable to have one to one and face to face.”

“There is this idea to widen the scheme and yet it sits uneasily with the method in which we are delivering it. So that does worry us about using and expanding that kind of technology (video conferencing)”

“Next year I will have two groups of students 80 miles apart, both wanting to do FP2 and FP3. I will be delivering a 50 minute lesson to them without going anywhere using “Elluminate”. It gives the flexibility of doing it outside of school time and getting all the students together at once; we are going to be playing around with it and just see how it goes and what we make of it.”

- **Publicity and Competitions/Commendations**

Although some Centres issued a press release at the time of their launch, it seemed that there was little response in most cases. It seems that mathematics as such is not very newsworthy. However, young people winning competitions or being awarded a commendation for outstanding achievement is. How to incorporate such possibilities into enrichment or even revision events so that the local media pick these up should be given consideration.

- **Role of the Local University**

The involvement of a local university, even if it is in a neighbouring region, seems to be a vital factor in the success of a Centre. It seems to be more important than having local authority advisors and consultants involved, although many managers clearly regard them to be important as well. Universities not only have the kudos to impress school-based students, but they also generally have more time and administrative help to run a Centre. There also seems to be a lot of enthusiasm in the academic community to “knock down the ivory tower”, i.e. they want to be involved with schools. In the longer term, MEI could consider dropping the “Further” and develop Centres into mathematics support centres that are independent of local authorities and support, and enhance the mathematical experiences of children of all ages.

Your Centre's region

1. *In this first section, we look at the region that your Further Mathematics Centre covers.*

First of all, how would you describe your region? (e.g. urban / rural / mix / diverse / compact)

Approximately, how many schools and colleges are there in your region that offer A-level maths?

And how many of these are currently providing Further Mathematics 'in house'?

What other views do you have concerning the scope of A-level maths and further maths provision in your region?

Launching your Centre

2. *Let us now look at the how it has been launching your Further Mathematics Centre.*

Where are you based as the Centre Manager?

How did you launch your Centre?

How have you publicised your Centre?

Who else is involved in your Centre (e.g. a university department; LEA advisor)?

How many schools/colleges have so far been in contact with your FM Centre?

And how many of them have registered with the Centre so far?

And how many have enrolled students with the Centre?

How do you anticipate the registration and enrolment of schools/colleges will be for your FM Centre over the next year?

What difficulties have you had in setting up the Centre?

Supporting Students

3. *Let us now look at the how your Further Mathematics Centre will be supporting students.*

How will your Centre carry out the support of Further Mathematics students?

Who will carry out this support?

What difficulties do you anticipate with the support?

Support for you in managing your Centre

4. *Let us now look at the support that you have had in managing your Centre.*

How did you find the initial training for Centre Managers?

How have you found working with your Management Committee?

What difficulties have you had, or do you anticipate having, in managing your Centre?

What support have you had from MEI? How did you find this support?

Future developments

5. *Let us now look into the future if we can.*

How do you see the Centre developing over the next three years?

What support do you anticipate requiring in the future?

And Finally...

6. **Is there anything else that you would like to say that has not been covered in the previous questions?**