

MEP Teacher Training

(Initial and professional development)

For the past 6 years, staff in the *Centre for Innovation in Mathematics Teaching* at the University of Exeter have been working with mathematics departments in schools and developing resources in order to implement a whole-class, interactive style of teaching in which pupils take more responsibility for their own learning. We are pleased that this has provided many schools with enhanced success but are concerned that it has not had the same effect everywhere.

From our observations and contact with schools, and more recently through the work of the *MEP* regional directors, Liz Henning and Rob Smith, we have found that successful implementation of *MEP* strategies in the classroom depends on:

- effective implementation of the full range of recommended *MEP* strategies, including:
 - good lesson preparation
 - highly interactive teaching, with pupils demonstrating and explaining at the board,
 - using a variety of activities in a lesson, some done with the whole class and some as individual work, which is closely monitored then reviewed with the whole class,
 - individual pupil mistakes used as teaching points with the whole class,
 - correct mathematical notation and vocabulary used at all times,
 - homework seen as an integral part of the learning process,
 - emphasis on mathematical logic, rather than trial and error, and encouragement of creative thinking,
 - relating mathematics to real-life applications where appropriate.
- a stable department, in which all members:
 - are committed as a team to the *MEP* approach teaching,
 - enjoy working with pupils,
 - are enthusiastic about mathematics,
 - are confident communicators,
 - are willing to try out new ideas and reflect on their effectiveness,
 - are given strong leadership by the head of department,
 - receive support from senior management.

However, we are working at a time when there is a severe shortage of mathematics teachers, so it is often difficult to fulfil all these conditions.

Training, both in-service and pre-service, was identified as the focus of our current work and this year we have been experimenting with a number of initiatives, some of which have shown sufficient promise to be taken further, although still on a pilot basis.

Pre-service Training

If we are to attract and retain creative and talented students, we need to provide an environment which is stimulating and exciting. To achieve this, we have adopted the *University Practice School* model of teacher training (as seen in many countries around the world, including Hungary) by designating *University Practice Departments*, where there is at least one expert teacher who takes on the role of

being responsible for a group of 4 to 6 future teachers, together with the University tutor. Initially, the group observes lessons given by the expert teacher and spends time with the teacher (and on some occasions, the University tutor) reviewing and critically analysing each lesson observed. As the practice progresses, the future teachers take over the lessons, planning with the whole group. Each lesson given by a future teacher is observed by the expert teacher, the other future teachers and, on occasions, the university tutor; again, the lesson is reviewed and analysed in depth afterwards. In this way, future teachers observe and discuss far more and teach less than students on the normal training route but become confident and reflective practitioners more quickly.

This method, if undertaken effectively, also has the advantages of providing:

- quality control,
- more involvement of university staff,
- a stimulating, positive, supportive environment in which to practice teaching.

We hope that it will result in producing committed professionals who are likely to remain in schools for a longer time than is currently the case.

On the negative side, there is considerable pressure on both the expert teacher and the school, and weak students are more exposed, which in the long run should be a positive aspect, as their talents might be better suited to another profession.

Currently, we have experimental groups at

Kingsbridge School, Kingsbridge, Devon

King Arthur's School, Wincanton, Somerset (both linked to the University of Exeter)

Matthew Moss High School, Rochdale (linked to Manchester Metropolitan University)

but we are keen to extend this scheme nationally to more schools and providers.

In-service Training

We think that the supportive environment used in our initial teacher training model is also the key to improving teaching in schools. Over the past 6 years, we have:

- produced progress reports,
- run courses ranging from one-day events to award-bearing CPD courses,
- provided videos of good practice,
- observed teaching and given oral and written feedback,
- held annual national conferences to disseminate research findings,
- held local workshops to discuss problems and offer advice,
- appointed two regional directors to work intensively with a limited number of departments and teachers.

For many teachers, this support has been effective in influencing, changing and improving their teaching but for many others it has produced little or no change in practice. It is crucial that we find other ways of supporting these teachers, otherwise they will continue to have a negative impact on pupils' learning of, motivation for, and attitude towards mathematics, which does not bode well for the future.

Our experiences have led us to base our proposed model for continued professional development on the following principles.

- Always focus on students' learning.
- Consider what teaching and the role of teachers should really entail.
- Initiatives to improve practice should be school-based.
- Bring teachers together to share experiences and good practice within and among schools.

Although outsiders can be a catalyst for short-term change, longer lasting improvement has to be school-based; just as we have created a supportive environment for our future teachers under the leadership of an expert teacher, we need to do the same for all teachers.

So our proposed model of sharing good practice and improving teaching is based on:

- mathematics department members agreeing to work collaboratively together on planning, teaching and reviewing;
- each week, finding time for two collaborative sessions: the first focusing on the preparation of a particular lesson to be given by one of the teachers (the *MEP* Year 7 and 8 lesson plans could be used as a starting point for discussion) and the second on reviewing its implementation;
- the demonstration lesson could be taught in protected time, or the use of ICT support could be used to free teachers, or the lesson could be videoed – but priority should be given to providing an opportunity for as many colleagues as possible to observe the chosen lesson;
- action plans should result from the review and discussions;
- team members take it in turns to teach the planned lessons.

While this model requires commitment on the part of all the team and, of course, backing from senior management, it should provide a supportive environment in which all teachers, however expert they are, can learn from each other and improve their practice.

In the short term, there is the possibility of some external support from *MEP* staff, and possibly some funding, but it is crucial that this initiative becomes an internal, reflective method for improving practice within a school, dispensing with the need for external intervention and only requiring imaginative timetabling. In other words, it should be very cost effective.