The University Practice School: A Collaborative Approach to Initial Teacher Training
About Cf/BT

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We work in 13 countries around the world, including the UK, providing education services and managing large government contracts. Learners and teachers are at the heart of everything that we do and we value educational outcomes which are inclusive and sustainable.

Our overarching commitment is to education – to enable individuals, institutions and communities to make better informed choices and broaden their opportunities. In the last 10 years Cf/BT has become one of the leading not-for-profit, international consultancies and we are proud that the surpluses we generate are reinvested in research and development programmes. We commit around £1 million of surpluses every year into practice-based educational research. This research project has been funded in this way, and it is hoped that the research findings will add to public debate and development in this field.

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About The Centre for Innovation in Mathematics Teaching

The Centre for Innovation in Mathematics Teaching (CIMT), under the directorship of Professor David Burghes, was established as a focus for research and curriculum development in mathematics education, particularly encouraging applications, real-life contexts and the effective use of ICT to enhance teaching and learning.

Since 1993, CIMT’s work has focused on longitudinal international research, with the aims of determining the factors that enhance mathematical understanding and attainment and putting the findings into practice in schools in the UK. This work has provided a foundation for CIMT’s current focus on initial and in-service teacher training.

CIMT is funded by grants and awards from charities, business and commerce, and more recently the TDA. All its resources, including an online international journal for mathematics teaching and learning, are freely available through its website, www.cimt.org.uk.
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Foreword

Cf/BT is pleased to have funded this important report into University Practice Schools. There are two aspects to Cf/BT: we provide educational services to clients, and the resulting surplus is used to fund public domain research such as that represented in this report. The Trustees of Cf/BT are proud of the way the organisation works for clients within commercial disciplines and then distributes its trading surplus to a wider circle of beneficiaries. Cf/BT is committed to its form as a not-for-profit education trust which contributes to the public good both through its contracts for clients and its research programme. Teacher training and development is a good example of a field in which we have worked operationally for clients through the provision of pre-service and inservice training, and, as this report illustrates, contributed towards improving public policy through applied research.

Cf/BT funds a wide range of development projects in education, working to a planned set of priorities, funding applicants and commissioning work from experts in our chosen fields. We like to make sure that ‘one thing leads to another’, so sustainability and impact are key to the research and development work that we do. We think in highly practical terms: development and research, rather than research and development.

This report contains important findings both for initial teacher training and for the professional learning of serving teachers. It emphasises the importance of collaborative professional learning and the need to focus on the lesson as the basic unit of effective pedagogy. The work described here very explicitly seeks to connect the development of practice in the UK with international best practice. We welcome this emphasis on learning from overseas. We also welcome the idea that highly effective schools and subject departments should be at the heart of pre-service and inservice training and development.

Stephen Yeo
Cf/BT Education Committee
Chairman

Tony McAleavy
Cf/BT Education
Director
A research project into the use of the University Practice School concept in initial teacher training

Overview

This report describes and evaluates the implementation of the University Practice School (UPS) concept in initial teacher education, relating particularly to the teaching practice phase of training undertaken in schools. The model of multiple placements under an experienced and effective teacher mentor, with the close involvement of the university tutor, and stressing collaborative observation of and reflection on lessons, is common in many high-performing continental countries, for example Hungary and Finland.

In the continental model, UPSs are used for initial teacher placements for all subjects. As there are no such schools in this country, we used instead effective mathematics departments in which the teacher mentors had been observed to be excellent teachers.

The project monitored two cohorts of students during academic years 2003/04 and 2004/05 in three universities. Despite initial problems, mainly with bureaucracy and paperwork both in schools and in universities, the majority of those involved regarded the initiative as a success and certainly worth continuing and promoting to other teacher training institutions. The main feature of the initiative was how quickly the university tutors, teacher mentors and student teachers felt part of a team investigating what good teaching is and continually learning from and supporting each other in their professional and personal development.

The first chapter (Burghes) is a general report on the initiative, followed by the experiences of three university tutors (Smith, Wright and Eade). The next four chapters are written from the point of view of an ITT coordinator in one of the schools involved (Scully) and that of three teacher mentors in three different schools (Morris, Westlake and Henning). The last chapter is a personal account from a trainee student on the experimental Exeter course, who has now been teaching for over a year (Davenport).

The appendix gives an insight into the UPS system in Hungary and Finland from the point of view of a university tutor (Szalontai) and the head of a practice school (Salo), and then discusses the extension of the collaborative practice concept to continuing professional development within schools (Hindle). Here, all staff in a department or school would observe, reflect on and plan lessons together in order to further their understanding of what constitutes good teaching and learning for the advancement not only of the teachers themselves, but also their pupils, their school and their profession. This is the focus for the forthcoming National Centre for Excellence in the Teaching of Mathematics, which builds on and extends our experiences from the project reported here.

David Burghes
Director, Centre for Innovation in Mathematics Teaching
University of Plymouth
Collaborative practice in initial teacher training

David Burghes  
Centre for Innovation in Mathematics Teaching, University of Plymouth

Context

The current partnership model now used in the UK can show a wide variation in provision.

- The quality of staff used in schools to train student teachers is not always good enough.
- The support given to trainee teachers varies considerably.
- Secondary trainee teachers tend to be placed on their own in subject departments and do not have other trainees to work with.
- University tutors have little control over which school tutors are used in the training and often have never observed them teach.
- The continual turnover of school staff is a problem in some subjects.
- Trainee teachers are often given low priority in a school situation, with talented staff often being diverted to problems more pressing than providing support for trainee teachers.

The research we have undertaken has given us an insight into established practice in other countries and hence a potential solution to the problems highlighted above.

In 1993, in the face of continual criticism of the standards of mathematical knowledge in students and employees from academics in mathematics departments in universities and from business and commerce, the Centre for Innovation in Mathematics Teaching secured a grant from the Gatsby Charitable Foundation to undertake a longitudinal international study, the Kassel Project, on the progress in mathematical knowledge of pupils during their last three years of compulsory education (Burghes, 2000).

During this study we developed a value-added model of analysis to indicate where good teaching was taking place and observed lessons at both extremes of the data. This was the first opportunity we had to observe everyday teaching in normal classrooms and we were disappointed at what we saw in many British schools, while at the same time amazed at what could be done and was being done in other countries such as Hungary, Czech Republic and Singapore. We wanted to give British pupils the same experiences and opportunities to learn and enjoy mathematics.

With the help of other country coordinators who had seen teaching in British schools, we formed recommendations for effective mathematics teaching for schools in this country (Burghes, 1999; Burghes et al., 2004), but the most important factor was whole-class interactive teaching, which we had not seen in any state project school in the UK. This involved pupils not just answering questions but demonstrating and articulating their methods and solutions in front of the class, sharing their thoughts and ideas and learning from the mistakes of others. They were also encouraged to think for themselves and critically evaluate alternative methods and solutions. The aim was to establish a friendly, supportive yet rigorous, appreciative, whole-class learning environment to which every pupil contributed and in which every pupil was valued and made progress.
In 1996, these Kassel Project recommendations were implemented in a secondary demonstration project which involved 100 volunteer secondary schools across England and Wales. It became known as the Mathematics Enhancement Programme (MEP) and was also funded by the Gatsby Charitable Foundation. So effective were the strategies when implemented comprehensively, that we felt it was crucial that pupils should be exposed to this style of learning much earlier, as they were in other European countries.

In 1998, the feeder primary schools to some MEP secondary schools also began implementing MEP recommendations, but because primary teachers were not always confident about their mathematical knowledge, detailed lesson plans based on Hungarian pedagogy were produced to make implementation easier. This primary phase of MEP was funded by PricewaterhouseCoopers.

The projects were evaluated using teacher and pupil questionnaires, yearly international tests (Kassel Project tests in secondary and International Project on Mathematics Attainment tests in primary), lesson observations and feedback. Again, value-added analysis indicated enhanced teaching and learning.

These projects showed that however good the resources (all project schools received the same pupil and teacher resources and initial inservice training), what mattered most were the skills, strategies and attitudes of the teachers. We returned again to Hungary to study how teachers were trained there and discovered that the collaborative learning in schools through whole-class interactive teaching also extended to the professional training of teachers. Collaborative practice was a feature of the courses and University Practice Schools (UPSs) were used to allow groups of trainee teachers (sometimes up to 12 in a group) to observe good teaching together and to discuss it in detail afterwards, guided by the teacher mentor and university tutor.

We experimented with this model in the UK and this report sets out the main findings. First of all, we give a fuller description of the key aspects of UPSs in Hungary, as this was essentially the model that we wished to replicate in the UK. More details of the Hungarian training model are given in the article by Tibor Szalontai and practice in a Finnish UPS are given in the article by Petri Salo in this report; other countries are considered in some detail in Burghes (2004).

**Observations**

**University Practice Schools**

The UPS model, as used in many European countries, addresses many of the problems in our current provision and is characterised by the following.

- School subject mentors in UPSs are always excellent subject teachers and regard the training of student teachers as their most important task. They are given a 50%–60% timetable in recognition of this responsibility.
- Trainee teachers work as a group, sometimes as many as 12, together with the subject mentor and the university tutor.
- The trainee teachers as a group observe demonstration lessons given by the school mentor, and these lessons are discussed and reviewed with the school mentor in depth immediately after the lesson in seminar rooms set aside for this purpose.
- Each trainee’s practice lesson is observed by the other trainee teachers and the school mentor, and regularly also with the university tutor in attendance, and is discussed at length immediately after the lesson.
- This method of training follows a similar philosophy to the interactive style of whole-class teaching we have seen in many continental countries, with the active involvement of trainee teachers, university tutor and school mentor.

School subject mentors can demonstrate excellent subject teaching to the trainees

A UPS demands the active involvement of the trainee teachers with the university tutor and school mentor
In summary, it is a cooperative venture in which everyone is moving forward and learning from each other. Our challenge was to replicate this practice as far as possible in English schools in order to evaluate its effectiveness in comparison with current partnership models.

**Participating institutions and methodology**

The project was based on evaluating this experimental practice in training secondary mathematics teachers at:

- University of Exeter (Programme leader: David Burghes)
- Manchester Metropolitan University (MMU) (Tutor: Barbara Craig)

using specifically selected partnership schools.

The project was extended to physical education training at:

- University of Exeter (Tutor: Will Katene)

and to secondary science at:

- Cambridge University (Tutor: Elaine Wilson)

during the lifetime of the project. The experiment was implemented over the two years 2003/04 and 2004/05, rather than the initially planned one year, and was funded by a grant from CfBT and a smaller TTA research grant. In 2004/05, a similar experiment was implemented for secondary mathematics at:

- Newcastle University (Tutor: David Wright)

The diagram below illustrates the framework recommended.

The key elements of the methodology of the project were:

- choosing the departments to use – we were keen to use only departments where all, or at least most, of the staff were confident, effective teachers;
- group size – we used two or four trainees for all the placements (at Exeter and Cambridge, it was their first placement; at MMU it was normally their second placement);
- the group first observed and reflected on lessons given by the expert teacher, with time set aside for this reflection with the teacher;
- each lesson given by a trainee teacher was observed by not just the mentor but also the other trainees and, on a regular basis, the university tutor;
- during the review of each lesson, there was an ordered sequence of contributions.

1. The trainee teacher who had given a lesson reflected on and discussed the lesson immediately after it had ended. All members of the group contributed to the lesson reviews, although the assessment of trainees’ lessons was the joint responsibility of the mentor and university tutor.
2. The other trainees added their comments.
3. The university tutor, if present, reviewed the lesson, where possible leading trainees to link pedagogical theory to actual practice.
The mentor (expert) teacher added any comments which had not already been made, led the ensuing whole-group discussion, summarised the main points made and highlighted action points for the trainee to address in his or her next practice lesson;

- the whole process was evaluated through:
  - interviews and questionnaires for trainee teachers;
  - video evidence of progress in teaching;
  - interviews and questionnaires for mentors and university tutors;
  - where possible, monitoring pupil progress in classes taught by trainees and also obtaining feedback from these pupils.

In this report, you will find articles by a number of those involved (university tutors: Rob Smith, David Wright and Frank Eade; subject mentors: Sandra Westlake, Jill Morris and Liz Henning; ITT coordinator: Rachel Sculley and trainee teacher: Clare Davenport) but we give below an overall evaluation, based on the two cohorts in mathematics at the University of Exeter.

Evaluation

After analysis of questionnaires and interviews we have summarised below the main responses, both positive and negative, to the experiment from different viewpoints.

i) Trainee teachers

Advantages

- Trainee teachers saw good teaching and took part in critical, reflective analysis from the start.
- Support was given by peers, with group discussions continuing in and out of school.
- High standards were set for the trainee teachers to aspire to.
- Trainee teachers were quickly made aware of potential problems that they might encounter.
- Trainee teachers quickly became reflective and able to evaluate their own and others’ teaching.

Disadvantages

- Trainee teachers undertook less teaching than they would have done on the traditional model (although they observed and analysed more).
- Some trainee teachers were not happy at first about their lessons being observed and criticised by others.

A few weaker trainees became too reliant on group support.

- The model might have stifled creativity and innovation at first, as at least one trainee teacher in a strong group was found to have been wary of innovation in case he failed and his failure was observed by the others.
- One or two individuals disrupted the cohesion of their groups.
- Less-able trainee teachers became demoralised and lost confidence when they saw their peers giving effective lessons but received only criticism for their own attempts.
- Some trainee teachers were reluctant to be critical of others.

Trainees first observe and analyse teaching of a high standard

Initially there is less teaching but more observation and reflection

Ideas, innovations and mistakes are shared and learned from
ii) **Mentor (expert) teachers**

**Advantages**
- Mentors had a greater involvement in the training process, working more closely with the university tutor and other mentors, sharing ideas and learning from other schools' problems and success.
- Mentors became more reflective about their own teaching strategies when they were under such intense scrutiny.
- Mentors quickly got to know the trainee teachers and soon became aware of potential problems.

**Disadvantages**
- Implementing the model was very hard work and very demanding and it was often difficult for mentors to find sufficient time for joint planning and lesson reviews.
- Trainee teachers were teaching many of the mentors' classes.
- There could be tension among all concerned when lessons did not go well.

iii) **University tutors**

**Advantages**
- Tutors had more involvement in the training process and became more aware of the day-to-day pressures on good teachers.
- Close cooperation with school departments meant that tutors almost became regarded as members of the teaching staff.
- There were greater opportunities for tutors to reflect on teaching and to experiment with their own teaching in the classroom.
- Strong links were forged with the mentors and trainees, providing a genuine team approach to teacher training.
- There was scope for involvement in other school activities (e.g. taking sessions for gifted and talented pupils).

**Disadvantages**
- It was difficult to find sufficient time for visits and in-depth discussions.
- There was a tendency to be sidetracked by non-teaching issues and by conflicts within groups of trainees.

iv) **Pupils**

**Advantages**
- There were more helpers in the classroom and consequently fewer discipline problems.
- Pupils were pleased to be involved in the training of the next generation of teachers.
- Pupils benefited from the contributions of creative, energetic young people at the cutting edge of research and development.

**Disadvantages**
- There was a reduction in lesson time delivered by experienced teachers.
- Some trainee teachers gave poor lessons.
- Some pupils were less willing to participate in lessons, as they felt intimidated demonstrating in front of the class and several adults.

There were other aspects that also need to be highlighted.
- Headteachers were not always keen to have so many trainee teachers in their schools and were concerned about possible negative reactions from parents.
- Initial teacher training mentors (not the subject mentors) felt that their role would be too time-consuming; they did not seem to understand the basis of collaborative practice.
Staff department offices could become very crowded at times, and it was not always easy to find suitable small rooms for the lesson reviews.

Overall, though, the positive responses far outweighed the negative ones (in fact over 90% of the two cohorts of 70 trainees were positive or very positive on the benefits of collaborative practice in training), and we have no reservations in recommending this model not only as an efficient and effective method of training student teachers, especially in their first teaching practice, but also as the basis for effective school inservice training. (Some schools involved in this experiment have adopted the collaborative practice model to raise their own standards of teaching; this is dealt with in the articles from both Jill Morris and Sandra Westlake in this report.) This will be discussed in the next section.

However, a number of caveats must be stated.

- Subject mentors (expert teachers) need a reduced timetable and protected time to enable them to give full support to their trainee teachers.
- Schools must be willing to release their teachers for this role, but it is often the case that these key teachers are called upon to participate in many other important aspects of school life.
- In some subjects, although not mathematics, there is an issue on whether there are sufficient numbers of lessons being taught to cope adequately with multiple placements.
- The relationship between trainees working in pairs can be fraught (particularly when one trainee is far more capable than the other); in our view, it is better to place four, or even six, trainees together.

**Collaborative practice model for CPD**

While observing teaching in Hungary, we had often seen teachers also observing the lessons; sometimes they were teachers in that same school, sometimes they had come from another school in the locality and sometimes they had travelled quite a distance to observe a certain teacher who was known to be effective. This informal method of continuing professional development (CPD) was instigated and sustained by the teachers themselves, although external CPD courses were also offered by the universities and educational institutions.

The key element of this practice was the discussion after the lesson and it was obvious that this was the same model, although much more informal, as that used in teacher training. In summary, teachers were expected and indeed wanted to continue to reflect on their practice and to learn from, and share ideas and innovations with, other teachers.

The concept is similar to the lesson study model used in Japan and now adopted in other countries, including the USA. These initiatives are described in more detail in the article by Mike Hindle in this report.
It should be stressed that our motivation for this type of teacher training and inservice training was based entirely on our research work and experiences in Eastern European countries, particularly Hungary, where pupil attainment and value-added scores were among the highest in our primary and secondary projects and where exciting, effective teaching was seen in almost every lesson we observed. The model they use for this type of inservice training mirrors the whole-class interactive teaching used in their classrooms, with all staff involved and sharing their thoughts and expertise for the benefit of the profession.

We have now experimented with this model of inservice training and are working with potential pathfinder schools for the forthcoming National Centre for Excellence in the Teaching of Mathematics (NCETM).

**Conclusion**

**Key findings**

- The vast majority of the participants were positive about the experiment.
- Many mentors were surprised at how much better the model was for training than the traditional model.
- Weak trainees were identified early in the practice; this was positive as immediate remedial action could, if appropriate, be taken by a wide support base.
- Trainees unsuited to teaching as a profession very quickly realised this for themselves and withdrew from the course.
- Talented trainees were given the opportunity to learn quickly and to try out new ideas and strategies in a positive, appreciative environment.

**Recommendations**

- At secondary level, for the initial placement, all trainees should be in subject groups of at least four.
- Time should be protected so that mentor teachers can participate fully in reflections on lessons.
- Whole schools should be designated as UPSs (or strong subject departments as university practice departments).
- University staff should work more closely with these schools (or departments), including teaching some classes and mentoring teachers in small-scale research studies.
- Such schools (or departments) should also be used for national research into effective teaching and learning and as bases for inservice training for other schools.

Nearly all concerned felt that this model represented a real enhancement in training, particularly in the first placement for trainees. Our personal view is that UPSs are needed in the UK, not just to provide an efficient and effective way of training teachers but also to establish a stronger link between university tutors and teachers, so that theory and practice are linked.

**References**


Collaborative practice for initial teacher training: Tutor’s perspective: 1

Robert Smith
Centre for Innovation in Mathematics Teaching, University of Plymouth

Context

The collaborative model of initial teacher training (ITT) for PGCE secondary mathematics at the University of Exeter, 2003/04 and 2004/05, saw trainees in pairs or fours (two pairs) for their first placement. It meant that each trainee taught half the usual load but was present in the classroom – as observer or assistant – for the other half, maintaining the necessary contact level. Trainees were expected to plan all lessons jointly and participate in each other’s lesson reviews.

Mathematics trainees did not follow the university’s usual ITT model because they tended to move more quickly to teaching whole lessons.

In the first year we carefully chose those schools we knew and had worked with, visiting them in the summer and early autumn to explain the collaborative model to heads of mathematics. Initial reluctance to take two (or four) was often overcome when we explained that each pair was expected to teach only the number of classes and lessons that one trainee would usually take but that the funding would still be for two trainees.

As university visiting tutor, I was able to observe the application of the model in action with 18 pairs of trainees in 14 departments over two years.

Observations

Where it worked well

The collaborative model worked well when the following conditions held.

- Trainees (and tutors) planned collaboratively.
  
  There were advantages to this approach to planning.
  
  - It focused on the process of planning as much as on the topic being planned.
  - It gave a good focus for trainees and tutors to discuss teaching and learning.
  - It made the lesson a joint production, in which trainees and the tutor had a vested interest.
  - Individuals sometimes gained fresh ideas and insights into the topic.
  - Individuals were able to contribute their ideas to colleagues.

- Trainees provided mutual practical and emotional support:
  
  - the moral support of not being alone;
  - practical support, e.g. sharing transport costs and resources.

- All school staff understood the model.
  
  - Subject tutors understood the philosophy and practicalities of the collaborative practice model.
  - Other staff involved in training, e.g. mentors and ITT coordinator, understood and were willing to implement the model.
  - Staff were ready to contact university tutors directly in the event of problems.

Characteristics of effective practice include:

- collaborative planning; mutual support;
- understanding of the model; tutor guidance of reviews; trainee contributions to whole process.
Reviews were conducted under the guidance of tutors (including a university visiting tutor as appropriate).
- Reviews were based on observations of specific behaviours by the trainee teacher.
- The trainee teacher was the first to reflect on the lesson.
- The tutor summed up the review and agreed with trainees on targets for development.

Trainees made equal contributions to the whole process.
- They took a similar view of the training process.
- They both (or all) participated fully in planning, teaching, supporting, observing and reviewing.

Teacher’s guidance in review, they ‘did not know what they did not know’.

The model was not understood by some school staff.
- Some mentors (non-mathematics staff) and ITT coordinators did not fully understand the collaborative practice model, perhaps because they had not attended training.
- Some mentors and ITT coordinators were happily wedded to the standard university model and unwilling to adapt, particularly where there were trainees in other subject areas or other phases (Key Stage 2 or Key Stage 3) or following the Graduate Training Programme who were using that model.

There were personality issues between trainees.

In two of the 18 pairs I observed, the relationship between the trainees deteriorated.
- One trainee perceived all comments from the partner as personal slights and the school decided to end collaboration and work with the trainees separately.
- One (strong) trainee came to believe that the (weak) partner had nothing to contribute to the training process. We agreed and the weaker partner left the course.

Where it did not work well

The collaborative model did not work well when any of the following situations arose.

- One of the pair/quartet was markedly weak or weaker: one was less able to contribute to planning, delivering and/or reviewing.

Trainees’ contributions to the process were unequal: one was less willing to contribute to planning, delivering and/or reviewing – what if neither did much?

Teachers did not contribute to lesson review. Where trainees lacked the expert

Conclusion

University visiting tutor’s perspective

With two (or four) trainees in a department, we used fewer departments, so I was able to visit more frequently and for longer, enabling positive working relationships to be developed with the mathematics teachers in all the schools and other staff involved in ITT in several (though not all). Mathematics trainees had twice as many university tutor visits as trainees in other subjects and I felt able to lighten the workload of the subject tutors at least a little.
There was no doubt that the model we were using, allied to the style of teaching we were advocating, exposed weak trainees very quickly. I considered this an advantage because it could trigger extra support or, in two cases, convince trainees to reconsider their career choice.

It was argued by some trainees – and tutors – that there was not much teaching going on and that trainees were applying for jobs and gaining interviews, and tutors were being asked for references, before the tutors had seen much classroom evidence. To an extent I could sympathise but I did point out that mathematics trainees were teaching more full lessons than those in other subjects. However, we did address this in the second year by increasing the peer teaching episodes in the first term at university and by insisting that all trainees taught at least some episodes – if not full lessons – during their weekly school visits in the first term and during the induction week at their first placement schools in November.

Quite honestly, I did not feel that the second year was as successful as the first, in terms of seeing the collaborative model implemented. I attributed this largely to our allowing the Partnership Office to organise placements for us and, although they took account of our negative preferences for some schools, they placed several pairs of trainees in departments we did not know, we had not worked with, and for whom the collaborative model was completely new.

From my point of view it was clear that the collaborative model had great potential and that its success rested on several factors.

- It was important that the paired trainees were able to work together in a mutually supportive and productive way.
- It was essential that all members of a school’s mathematics department understood exactly what was expected of them and the trainees, including the need to make time for lesson reviews.
- Other school staff involved in ITT needed to be clear about what we were trying to do so they could provide appropriate support.
Collaborative practice for initial teacher training: 
Tutor’s perspective: 2

David Wright, Teaching Fellow in Mathematics Education
School of Education, Communication and Language Sciences, University of Newcastle

Context
The University of Newcastle has been using paired placements as part of the initial five-week ‘diagnostic’ practicum for some time. For the past two years this arrangement has been further developed, with a small number of schools, for mathematics placements. Two schools agreed to take up to four trainees each and to enhance the way that the subject mentors supported the trainees.

Eight trainees joined these schools, four in each school, for the first serial placement (two days per week for five weeks) and diagnostic placement (a further five weeks full time) in the autumn term 2004. During the diagnostic placement a researcher visited each school several times to collect data. At the conclusion of the placement the trainees, mentors and heads of department were asked to complete questionnaires about their experience so far. Further interviews with the trainees were held when they completed their long teaching placement.

In the second year of the project (autumn 2005), one of the schools decided to continue with the arrangement. Interviews and questionnaires were used to evaluate the experience both of the trainees and of the mentor involved in this second year.

Observations
The dimensions of the placement which were developed were as follows.

- Solo teaching responsibility decreased.
- Team or paired teaching increased.
- Observation of mentor teaching increased.
- Observation by mentor and fellow trainees increased.
- Time for planning and evaluating increased.

- The time allowed for the mentor to work with the trainees increased.
- The coaching dimension was enhanced by developing a core of three demonstration lessons taught by the mentor, together with briefing and debriefing sessions for trainees for each lesson. This might be thought of as inverse coaching.
- A video was made of each trainee teaching and the corresponding mentoring session at the beginning and end of the placement.

Issues in recruiting schools to the project

- Schools would not participate because of the extra mentoring time required by the project, even though this time was paid for by the project. Many schools said they were unwilling or unable to find a replacement teacher to cover for the mentor. (Each school was asked to find an extra eight teaching sessions for the mentor to work with the trainees, i.e. about one third of their timetable.)
- Another factor affecting schools’ participation was their perception (not necessarily correct) that this arrangement would increase the number of pupils being taught by trainees.
Issues arising from the running of the project

- The reorganisation of timetables required by the project for the mentor was a major problem. One school with a very large mathematics department was able to resolve this. The other school decided to split the mentoring duties between two members of staff.
- The mentors did not start focused work with the trainees until the serial placement was finished. This was a constraint on the development of the trainees. For example, the trainees took some time to appreciate the importance of evaluation – their initial focus was on planning and delivery.
- The videos made by the researcher were thought to be very valuable.
- The amount of time available for planning, observation and evaluation was initially very much appreciated by the trainees. However, some thought that towards the end of the placement this could have been reduced as they wanted to spend more time actually teaching, once they had gained confidence.
- The trainees’ feedback was very positive for all aspects of the project. Apart from the points already mentioned, they appreciated the opportunity to discuss a lesson in detail with an experienced teacher, and a large group of fellow trainees gave them extra support and a variety of points of view about teaching.
- One or two trainees thought that initially they were treated as a group rather than as individuals, which made it difficult to get focused feedback.

Second year of the project

- One school (a specialist mathematics college) decided to continue with the project even though the extra financial aid did not continue (apart from the extra finance associated with higher numbers of trainees). This was the school that had identified a single mentor for the project. The other school’s senior management team felt that the arrangement required too much disruption for staff and pupils.
- The way in which the mentor worked with the trainees continued to evolve. These changes and their consequences are still being evaluated.
- The Newcastle University partnership as a whole expanded some of the dimensions of the project to the whole partnership, particularly in support of the development of the PGCE into the M.Ed/QTS route. The following arrangements were generally established across the partnership for the diagnostic placement:
  - the use of video to support the analysis of teaching;
  - the expectation that trainees will be allocated to schools in teams and will have specific research tasks to carry out in those teams;
  - a reduction in the time spent teaching and an increase in focused observation, team teaching and planning.

Issues for the university tutor

- The increased number of trainees allocated to the schools led to more time being spent in the school by the university tutor and heightened the...
relationship with the department and school. This in turn led to opportunities for discussion of further initiatives both for teacher training and for curriculum development research, for example visits by the department staff to the University of Newcastle to participate in the teaching sessions there, and agreement to trial curriculum materials developed by the University of Newcastle in the school department.

- The agreements established for participation in the project enhanced the partnership relationship and meant that it was easier to initiate a research focus on the mentoring relationship.

- The increased number of trainees working together created a critical mass at some points which produced spontaneous ideas for trainees working together, for example trainees working as a team in a class, one teaching, one supervising disciplinary issues and one acting as an impartial observer.

- The willingness of some departments to experiment with different ways of mentoring makes it easier to raise these ideas across the partnership.

- The successful outcome of some of the developments, for example the use of video, led to its adoption across the whole PGCE cohort.

- The main negative consequence is the decrease in the number of schools used in the diagnostic practicum and the necessity to manage relationships with departments that have not been allocated trainees as a consequence of this.

Increased contact with a university is an opportunity for curriculum development and research.
Collaborative practice for initial teacher training: Tutor’s perspective: 3

Frank Eade
Faculty of Education, Manchester Metropolitan University

Context
At the Centre for Mathematics Education at Manchester Metropolitan University we use two models of block school experience on our secondary courses:
(i) a standard attachment, where one trainee is placed in a department under the supervision of a trained subject mentor. Trainee teachers are required to complete a number of tasks during these attachments, partly to prevent the placement being perceived as only for practising teaching skills;
(ii) a variant of (i), based on a collaboration with the University of Exeter, where trainees are placed in a department in groups of up to four trainees under the supervision of a trained subject mentor. These trainees take only the mentor’s classes and there is an assumption that the trainees will adopt the best aspects of the mentor’s approach to teaching. Mentors chosen to operate this model are generally recognised as being high quality teachers with insights into the teaching of mathematics above the norm. The perceived advantage is that a highly skilled mentor inducts trainees into teaching. It also means that we do not require the use of less effective mentors or schools in this role.

To examine beliefs about the different forms of attachments, both tutors and trainee teachers completed a questionnaire. Mentors involved in the type (ii) block attachment were also asked about their views on this and other forms of attachment.

Observations
Tutors’ views

Generally, block placement type (i) is seen as a vehicle for developing some important skills, such as class management, record keeping and developing awareness of how departments and schools operate. There is, however, some disquiet that after, say, six weeks of a placement, trainees plateau: that some basic skills have been fine tuned but that trainees find difficulties in developing more refined aspects of effective teaching. Clearly, the quality of the school-based mentoring and the potential of the trainee teacher are significant factors in how a trainee teacher develops through a placement.

Tutors generally considered that block placement type (i) plays a significant role in supporting the development of effective practice. However, tutors believe that placements over seven weeks in length are not the most effective use of time in school.

Block placement type (ii) was initially viewed with a degree of scepticism. Gradually, however, tutors saw advantages in such a model, particularly when trainees worked with very effective teachers. The advantage of this model used in conjunction with type (i) is that choice of placements for type (ii) trainee teachers is improved. It has however been noted that departments committing to type (ii) attachment in initial block are reluctant to take trainee teachers for an attachment later in the same year.

Tutors are clear that they wish to continue to explore this model of placement.
Trainee teachers’ views
Generally, trainees appreciate the opportunity to gain type (i) experience of being real teachers and recognise that the expertise of the mentors supports this development.

Trainee teachers experiencing type (ii) placements like the opportunity to work with peers and appreciate the attention given to them by a highly skilled mentor. Significantly, trainee teachers’ evaluation of the value of this type of attachment rises dramatically after they have had a subsequent type (i) attachment. Trainee teachers feel that although a type (i) experience has real value in helping develop essential skills, attachments where other peers are involved force the trainee teacher to reflect more deeply and engage effectively with higher level teaching. Several trainee teachers indicated that shortening the initial block type (i) would allow for this attachment to be extended.

Mentors’ views
Mentors find the type (ii) placement professionally very satisfying but also very demanding. Several mention the professional insights obtained from such a placement and very close professional relationships with trainee teachers. Encouraging the trainee teachers to develop critical thinking skills and using the trainee teacher as a critical friend are seen as important features of the role. Some mentors believe that more than two trainees per mentor is too demanding, but four trainees with two mentors is a reasonable model.

Conclusion

Key findings
- Generally a combination of attachment types is recognised as having the potential for maximising trainee potential.
- Type (i) attachments lasting more than seven weeks may not be the best way of using time in school.
- Attachments that use expert mentors and tutors seem to have most influence on the high-level skills acquisition of trainee teachers.

Recommendations
Tutors, mentors and trainees are clear that the type (ii) attachment involving more than one trainee teacher learning from a mentor is an important strategic tool in raising the standard of initial teaching in schools. It is a means by which educational theory can be seen to interact with educational practice for the long-term benefit of the trainee teacher and the school-based mentor. We have no hesitation in recommending that exploring this approach be continued, to establish the limitations and potential of its use.
Collaborative practice for initial teacher training: Teacher mentor’s perspective: 1

Rachel Scully, Deputy Headteacher
King Arthur’s Community School, Wincanton, Somerset

Context

Included in my responsibilities as the Deputy Headteacher at King Arthur’s Community School were initial teacher training (ITT) and continuing professional development (CPD). As the years unfolded it became more and more evident that the two were inextricably linked and no more so than during the period of King Arthur’s mathematics department’s involvement in the collaborative practice project for teacher training.

We joined the programme at its beginning in 2002, working with two trainees in the first year, four in the second and again two in the third year. With only a few qualifications (but those important), the partnership with Professor Burghes and his MEP team at Exeter University was very valuable, both for the department and the school.

Observations

Positive aspects

The main advantage for me was the excellent model the collaborative practice project gave for CPD. The mathematics teachers were fully involved, and developed their own confidence and competence, in the processes expected of the trainees: to plan jointly, share expertise, agree a focus, encourage critical reflection in a supportive non-judgemental climate, and provide a forum for stimulating discussion on pedagogy. It soon became clear that the traditional role of ITT mentor was evolving into that of coach.

Working in a close partnership with the trainees helped us all to reflect on our practice and was a constant reminder about our relationships with all learners. Practising giving feedback sensitively and purposefully and negotiating ways forward, for example, complemented our whole-school focus on assessment for learning.

These experiences played a valuable part in setting a climate in the department and the school which would encourage critical reflection on classroom practice, one of our strategies for raising achievement.

Subsequently, a programme for peer observations for colleagues was relatively smoothly introduced and was well received. The quality of teachers’ notes on lessons was a pleasing testament to how confident colleagues were in constructively analysing lessons and how focused they were on learning. I am sure that the collaborative ITT practice helped to pave the way for this success.

Some concerns

It has to be recognised, however, that the spin-offs for the professional development of all teachers were not without cost.

My workload as the professional tutor was greatly increased. The increased number of trainees, especially when there were four needing individual support, and the Exeter meetings at least every two weeks caused some pressure on my time. In the main we were very fortunate with the commitment and capacity of the trainees. With only one exception during the three years they were able to manage the additional demands the collaborative project made on them.
These were not the only trainees in the school. Other departments were involved and of course the needs of these trainees had to be managed too. In a relatively small school we were in danger of being over capacity and it was a constant concern that our pupils’ education might suffer. These fears proved to be groundless, certainly for standards in the mathematics department, which continued to be high.

Contrary to my fears that pupils would be intimidated by the cohort of observers at the back of the class (sometimes four or more if I was observing for quality assurance), they took it in their stride and seemed unaffected either positively or adversely.

An additional challenge was finding tutor groups for a larger number of trainees. Our staff are very supportive and sympathetic to their training needs, but the goodwill of the very good form tutors, who were frequently asked to work with a trainee, was wearing a little thin.

I also needed to be sympathetic to the increased demands on the mathematics subject tutor’s time. With a supportive, competent team she was able to delegate certain tasks but clearly she was under pressure at certain times and sometimes found it difficult to juggle the demands of her ITT role and that of curriculum coordinator.

Anyone without her excellent professionalism and efficiency could find the pressure a problem.

**Conclusion**

**Some implications for our continuing practice in ITT**

Although King Arthur’s is no longer involved in the programme as part of our ITT provision, a key characteristic has been incorporated into my practice.

In relatively small schools it is not always practical to take more than one trainee per department. However, the pilot project model can be modified for use across subject areas. In fact I believe there are definite advantages to encouraging reflection on generic teaching and learning issues and for trainees to acquire a wider variety of approaches to motivate pupils and facilitate learning.

I have been very interested in exploring the differences between coaching and mentoring. Following discussion with a Fast Track trainee last year, the trainee researched the implications of these differences for her educational study. Her conclusions have encouraged me to move quickly from an initial traditional mentoring role at the beginning of the year to an increasingly coaching relationship with the trainee. It is my intention in my role as professional tutor across our three-school consortium for ITT, initiated 18 months ago, to develop similar practice between the subject mentors and their trainees.
Collaborative practice for initial teacher training: Teacher mentor’s perspective: 2

Jill Morris, Head of Mathematics
King Arthur’s Community School, Wincanton, Somerset

Context
Three years ago it was suggested to King Arthur’s School mathematics department that we might like to become part of a pilot project in conjunction with David Burghes, the Mathematics Enhancement Programme and Exeter University. It was discussed with the mathematics line manager and we agreed to join the project.

The initial discussions considered having four trainees joining the department; as it turned out, we eventually had two in our first year. This was very successful: the following year we had four trainees, and finally, last year we had two.

One of the main obstacles to finding a larger group was the difficulty in finding trainees willing to live and work in Wincanton rather than closer to Exeter.

Observations
The main ideas used in the model were:

- Keen trainees were very quickly aware of the skills needed to take a whole lesson.
- The complete picture of a lesson was necessary early in the teaching.
- Trainees were aware of problems that could arise from both their own and others’ lessons. They were getting experience even if they were not taking the lesson themselves.
- The group was very supportive and protective of each other; there were always ideas to help overcome difficulties. Individuals were encouraged to find solutions in a supportive team.
- When subject knowledge was an issue, the knowledge was always within the group.
- Responsibility for content of the lesson was shared, so trainees became aware of the needs of a larger variety of classes.
- Trainees became very used to taking comments and, as they were usually constructive, listening to advice.
- Keen trainees were very quickly aware of the skills needed to take a whole lesson.
- The complete picture of a lesson was necessary early in the teaching.
- Trainees were aware of problems that could arise from both their own and others’ lessons. They were getting experience even if they were not taking the lesson themselves.

Many good points arose from using this model.

There is mutual support and access to the group’s knowledge; there are shared responsibility and shared skills.
The model allowed more transference and sharing of skills; they were able to gain confidence and learn from each other's positive and negative outcomes.

By supporting each other the trainees minimised the time and attention needed from the expert teacher.

There were some less helpful aspects of the system.

- Weak members of the group were perhaps over-supported and their lack of skill and commitment were covered up.
- Time was a real issue. Often I would need to teach straight after the lesson, and this was not good as feedback was best given immediately, especially if the lesson had not gone as expected.

**Conclusion**

I felt that the model worked particularly well with the larger group as they generally got on and respected each other's views. With just two trainees it became very difficult when they had problems. With four this seemed to be dissipated and less important – the focus was on the teaching and learning.

The model carries over into continuing professional development within our own department. We have on several occasions used the model to observe our own lessons with the whole department and then used the review not only to inform the experienced members but also as inservice training for the non-specialist teachers. They have found the experience valuable and are very keen to continue.

The next step will be to try to video all the teachers of a year group – we are going to try Year 9 – and then compare the styles of teaching with different ability groups. The video should alleviate the problem of time, and also our not wishing to leave our own classes to observe others. While we are aware of the benefits, we also know that pupils do not learn as well when they are without their normal member of staff.

The experience with the collaborative practice pilot has been really valuable and has certainly permeated our departmental reviews of teaching and learning.
Collaborative practice for initial teacher training: Teacher mentor’s perspective: 3

Sandra Westlake
Kingsbridge Community College, Devon

Context
It was in the spring term of 2003 that we first began to pilot collaborative initial teacher training (ITT) at Kingsbridge Community College. Before that the mathematics department had long been involved in implementing an interactive style of teaching within the Mathematics Enhancement Programme under the direction of Professor David Burghes (then at the University of Exeter), which was based on studies of the Hungarian system. It was, therefore, a natural extension to take this a step further and look at the way we trained our student teachers. David and his team designed a PGCE secondary course with the first term based in the university except for periods of observation in primary schools. It is because of our long relationship with David and his university that we felt we wanted to be involved. I will try to explain how we implemented our part of his course and compare it with what we had experienced in previous practices.

Observations
Starting the process
A group of two or four trainees began their school-based experience by following a pupil’s activities, shadowing a learning support assistant and working in the resources department as part of the school’s usual induction of ITT students. The next 1½ weeks was spent in the department with the expert teacher, who took on the role of demonstrator and trainer with the collaborative scheme, as opposed to the role of an assessor on the single placement scheme.

Together the group of trainees observed the expert teacher for all of their mathematics lessons for the 1½ weeks and each completed an A3 observation sheet which would prompt a debrief discussion later. Items recorded were the activities of the pupils and teacher, timings, questions, praise, reprimands, seating arrangements and elements expected in an MEP interactive lesson. There was emphasis on learning from the trainee and being able to question their practice. The intense period of observation also involved videorecording lessons and took some getting used to on the part of both expert teacher and the pupils but enabled the trainees to see a range of teaching skills being demonstrated, whetting their appetite to get started.

Debriefing
A debrief discussion was led by the teacher who taught the lesson. In the first instance this was the expert teacher but later it would be one of the trainees. This took place during the expert teacher’s spare time, whether lunchtime or preparation time.
in a booked conference room. The debrief involved their explaining what went well and what went badly or what improvements could be made to the lesson before the trainees were expected to offer their views and analytically criticise the lesson. Through discussion, the subsequent lesson was collaboratively planned. (Previously there had been incidental observation of the tutor’s lessons, rather than it forming part of the learning process; there had been no formal discussion of their lessons.)

This cycle was repeated, enabling the trainees to learn how to plan a lesson from the syllabus with the content at the correct level, activities for the pupils, resources, homework and timings. All aspects of classroom management were also discussed to enable the familiarisation of procedures and school behavioural policies. Initially it was difficult for both expert teacher and trainees to feel comfortable about discussing their lessons but as we all got to know each other the group relaxed and began to be supportive of each other. A single placement can be lonely in this respect.

**Taking whole lessons**

Each of the trainees took over one of my classes entirely and taught whole lessons which had been collaboratively planned. Observation records were completed by the expert teacher and the other trainees. The debrief cycle continued and the group became more confident at analysing each other’s lessons and at planning together. It was at this stage of the process that weaker members of the group were quickly identified. If they were honest about it then they appreciated the support of the others but if they were not honest about their performance and were unable to take on board advice then early intervention made it the right time to reconsider their choice of profession. Previously the single placement student began their experience by taking over part of a lesson, for example seeing the class in or taking the register. In my experience this presented a problem for the pupils. They were not sure who was actually in charge of the class. I found it was possible for a trainee to complete all their agenda items effectively but when it came to teaching a whole lesson they found it difficult to put all the ingredients of a lesson together successfully, or did so too late in the process.

After the half-term the trainees paired up and took on another class, usually from another member of the department. Observation of the expert teachers and their partners’ lessons continued, with smaller group debriefs. This became more difficult to timetable but usually took less time than when we started and it was done in a more informal setting as they became more self-analytical. They continued to plan and discuss together but were gradually becoming more independent at planning and designing their own resources. At this stage of the process the expert teacher formally assessed their progress and performance before the next stage was taken – a final teaching practice placement in another school in the summer term.

The final teaching practice was normally worked as a pair and the trainee took on two or three classes within the department immediately, continuing with observation. ‘A’ level experience was gained by observation and often taking a single lesson or two, depending on experience and knowledge. It was now that some staff gained some time back to replace their earlier input.

**Conclusion**

Collaborative teaching practice encourages the sharing of good practice and supports everyone involved. Weak trainees are quickly exposed and time is not wasted where there is no potential. It can be a very pressurised process for the expert teacher but there is regular contact with the university tutors and it is worthwhile for the recognition and appreciation you have of your own skills that you have taken for granted for so long. It is a multi-faceted role of demonstrator, trainer and assessor and one which I have found very satisfying and more involved than just supplying a
class for a trainee to practice with the previous schemes.

The collaborative idea has been extended further into our department as a method of professional development. Within small teams, staff in the department collaboratively plan, observe and review each other’s lessons in order to share good practices and gain support, further knowledge and good ideas. Hence we find ourselves piloting how collaborative professional development can work (or not) as a form of inservice training. None of these ideas could be trialled without the full support of the head of department and my inspiring colleagues, whom I thank.
Collaborative practice for initial teacher training:
Teacher mentor’s perspective: 4

Liz Henning
Matthew Moss High School, Rochdale

Context
The aim of this initiative was to investigate alternative provision for initial teacher training (ITT) students based on the model in operation in many eastern European countries. The basic principle is to allow a group of trainee teachers to work closely with one expert teacher so as to learn good practice from the outset and to work closely with other trainees to gain support, ideas and advice. This involved an intense programme of observations followed by a group evaluation. In all sessions the following protocol was adhered to.

1. The person who taught the lesson gave their view on it first.
2. Each of the other trainees in turn then voiced their opinions, advice and ideas.
3. I offered my views.
4. Finally, if the university tutor was present, they would present their comments.

During the planning stages between David Burghes of Exeter University and mathematics lecturers at Manchester Metropolitan University it was agreed that ITT students would be asked to volunteer to be part of the project. Four trainees were selected, and Matthew Moss High School (where I was formerly head of mathematics) was approached to act as host. Initially I taught the timetable with the four trainees observing. As soon as possible after each lesson, a discussion took place.

Observations
In all, there were three distinct phases to the process following a two-week period of observing my teaching.

- In phase 1, lasting four weeks, the trainees took responsibility for one of the four Key Stage 3 classes they had all observed, while assisting with planning and observing the other three. They were also asked to attend and eventually assist with registrations and PSHE. The form tutor and head of year were available for any queries.

Towards the end of the phase the trainees were asked to observe a Year 10 group in the week prior to work experience. This allowed access to Key Stage 4 pupils and each trainee was assigned one class each without any other ITT observers. This was designed as a necessary part of the process to avoid the trainee becoming too dependent on other adults being available to assist in planning and teaching lessons.

- In phase 2, lasting three weeks, the group split into pairs, so observing one trainee rather than three. This allowed more time for independent class contact. Each pair continued to observe and support the other and maintained their teaching commitment with the Key Stage 3 class.

- By the third phase, the final two weeks, all trainees were planning, teaching and evaluating independently of each other, assisted only by my self and university tutors as necessary.
The views of the trainees were elicited at various stages throughout the practice. This experience was slightly unusual: as I was no longer a teacher at the school, I did not have the normal duties of everyday school life, for example attending staff meetings, covering for absent staff and doing weekly duties. Although this lightened the load placed upon me, it was still quite an intense experience. As I became more acquainted with the four they became very important to me and their successes and failures became mine too. It was particularly stressful when it became obvious that one of the four would not pass the ITT standards and was put ‘at risk of failure’. In spite of further support from myself and the university tutors this trainee decided to leave the practice. This, I believe, was not a weakness of the project, as the trainee concerned may have benefited from this type of intensive supportive programme on the first practice and may have had more opportunity to develop.

Strengths
The system’s strengths are as follows.

- Trainees can plan and prepare together and provide each other with considerable support.
- They can collect and share data for university assignments.
- Being assigned to one teacher provides consistency of approach.
- Being assigned to one teacher allows overall improvement to be more easily monitored.
- Observing other trainees can provide invaluable insight into other ways of working, helps develop a repertoire of strategies and gives exposure to a variety of topics being taught.
- Stronger trainees can be paired with weaker ones. If parallel groups and topics are taught this can be immensely helpful to the weaker one of the pair.
- Having time to evaluate lessons allows the trainees the opportunity to consider their lessons in fine detail and increases their ability to become reflective practitioners.
- Contact between school and the university tutors is enhanced with the increased frequency of visits.

Weaknesses
Potential weaknesses include the following.

- There may be internal personality conflict between the trainees and this may add to the stresses usually present in any teaching practice.
- The stronger trainees may feel that they are ‘carrying’ the weaker ones and resources may not be shared equally. One may be producing and sharing resources while others are not, and this can lead to friction.
- It may be difficult to house four extra people in a department and to find room for them in one classroom.
- We found that the trainees did not have sufficient time to gain full independence and teach alone for a long enough time and with a wide range of groups.
- This model is very intense and time-consuming. Considerable time is needed outside school hours if all lessons are to be examined in detail.
- An expert teacher with a normal teaching load could not possibly replicate the model used here and would need to be given a considerably reduced teaching load and responsibilities (such as not having a form class).

Conclusion
Recommendations
This model could be very useful in first placements.

Four trainees could be linked with one expert teacher at the start of this placement and observe each other for the first few weeks.

After a short time, of say three weeks, the four should be split into two lots of two and
the teaching load increased to give greater access to various age and ability groups. In the second placement the model could be applied for the initial few weeks but the trainees would need to be given much greater independence sooner than was allowed in the pilot.

After an initial link with one expert teacher the model should be extended and widened to allow access to a variety of classroom management and teaching styles.
My teacher training at Exeter University was unique in many ways. Lectures were interesting and varied, consisting of ideas for mathematics and ICT in the classroom, voice control and body language and the history of mathematics, to mention just a few subjects covered. We were also offered an interesting opportunity to visit several schools in Hungary, with the aim of observing their interactive and highly successful teaching practice. This was an experience I found fascinating and extremely useful. Furthermore, within our teaching practices, there was an introduction of a collaborative approach. This meant that we were sent to selected secondary schools in groups rather than individually.

During the first term of our PGCE course we visited several local secondary schools to observe mathematics lessons being taught to a wide range of abilities and ages. During these visits we observed lessons using a standard observation sheet which we would use later in our placements. These schools had been selected by Professor Burghes and so provided us with many excellent examples of teaching from which we could gain inspiration. We visited these schools in groups and this enabled us to discuss in great detail some of the techniques we had seen in practice. It was interesting that as a group we shared varying ideas and opinions. Although we were often in agreement when it came to good practice in the classroom, it was evident that we would become very different teachers.

In the second term our group reduced to four and we all started a placement at King Arthur’s Secondary School, Wincanton. As four individuals we were contrasting in age, background and ambitions. As a large group in a fairly small department I believe we had a substantial influence on the atmosphere of the department. We realised that we had created work for the staff and so tried to give something back. We helped organise several mathematics events during our placement, supported weaker pupils with National Curriculum test revision and created resources that could be used in the future.

There were several advantages to this collaborative approach. As a group we planned lessons together and supported each other if we were teaching an unfamiliar area. Similarly, before writing a lesson plan, ideas and resources were pooled, which opened our eyes to different approaches that as individuals we would not have considered. Discussions of games to be played or different methods of teaching topics also highlighted areas of weakness or confusion which would otherwise have been exposed to a class. Several lessons were even rehearsed to other members of the group, producing a higher quality of presentation in front of the class. In every lesson taught, one or more of the group would observe each lesson using the standard observation sheet. Afterwards, the group would discuss how successful it had...
been. As a team we supported each other, and it was certainly reassuring to discuss problems we had encountered with those in a similar situation. The benefits of a collaborative approach have been highlighted but I believe it is also of value to discuss the disadvantages of working in a group during a teaching placement. It could be considered that the dynamics of our group, with such contrasting individuals, was to blame for perhaps some of the negative experiences that arose working in this way. Indeed, as some of the team began to teach challenging lessons, relishing the experience of a group debrief after each lesson, some did not enjoy such debate. This was perhaps because as passionate but inexperienced teachers we did not yet have the skills to highlight weaknesses in such a way as to provide constructive criticism. Certainly in a time when several individuals felt under pressure to produce high quality lessons, the presence of several adults at the back of the classroom did nothing to help them improve. I also felt that despite the obvious advantages of working in a group, our number did not allow us to integrate within the school as easily as if we had been on our own.

On reflection, I believe that the experience I gained from my first teaching placement at King Arthur’s was invaluable to my development as a teacher, not solely because of the high quality of teaching staff but also due to the process of writing lesson plans and developing materials as a group. Within our group, there was a range of personalities and qualities which gave me a good insight to what working in a department would be like. I learned that while as individuals our lessons had varied greatly, our idea of good practice was common. I realised that observing lessons and being observed provided excellent opportunities for development. I am now in my second year of teaching and am continuing to use my experiences from initial teacher training. I am a confident and successful teacher and like planning lessons with other teachers and team teaching, skills I learned at King Arthur’s. I enjoy the experience of being observed and I have recently been asked to become a leading teacher for my school. I think it will be an excellent experience and will be a continuation of my development as a teacher.
Appendix
Background information about the Hungarian system and current situation

PRIMARY

Our primary teacher training for school years 1–4 (and subject specialisation for years 5–6) is a four-year (240-credit) complex B.Ed course which has survived the current changes in our higher education system resulting from the Bologna process. Its compulsory component consists of:

I social studies and informatics (23 credits);
I psychology and pedagogy (28 credits);
I seven academic subjects and their teaching methodologies (92 credits), including mathematics (15 credits);
I school-based practice (29 credits);
I diploma work (15 credits).

In addition, for years 5–6, there is a compulsory specialisation in a subject area, e.g. mathematics (23 credits) and its teaching practice (8 credits). Unfortunately, the number of trainees who choose to specialise in mathematics is quite small.

Normal teaching practice covers all seven academic subjects, but Hungarian and mathematics are allocated more time than the other subjects.

The 29 credits of school-based practice mentioned above are gained from the following sequence of work:

1 individual complex pedagogical and psychological practice at a University Practice School (UPS) and other schools over four semesters (40 hours, 4 credits);
2 group teaching practice at a UPS for two semesters (6 credits), consisting of 3 hours per week of a collaborative practice model of training: trainees teaching in front of their peer group, plus discussion, plus preparation for the next group day;
3 group and individual teaching practice at a UPS for two semesters (10 credits), consisting of 3 hours per week of collaborative practice plus two batches of 12 lessons taught individually, observed by the mentor and often by some of the other trainees;
4 complex individual teaching practice with a mentor teacher in an ordinary school for the last semester (9 credits: 50 lessons observed and taught over one month);
5 an examination lesson taught at a UPS in front of an examining committee consisting at least of a UPS mentor and a university or college tutor.

Collaborative teaching practice in teacher training

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The University Practice School: A Collaborative Approach to Initial Teacher Training

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Our dual and complex subject teacher training system which trains one- or two-subject teachers can be either a four-year (240-credit) college level course for teaching pupils in years 5–8 or 5–10 and resulting in a B.Ed or B.Sc degree, or a five-year (300-credit) university-level course for teaching pupils in years 5–7 or 9–12 resulting in an M.Ed or M.Sc degree.

However, this system is being phased out gradually from 2006 and changed to a unified two-year (120-credit) Master's degree teacher training course following a B.Sc degree. At the moment, nobody knows what the new Master’s degree course will be like. Accreditation of current teacher training colleges for Master's degree training and the retention of UPSs are both uncertain.

In the system being phased out, the college-level course for mathematics plus another subject with teacher training consists of scientific courses on two subjects (75 credits per subject), diploma work (15 credits), facultative and intellectual aspects (25 credits) and teacher qualification (50 credits). The latter contains pedagogical and psychological courses (23 credits), the two subject methodologies (12 credits) and school-based work (15 credits).

The school-based work consists of the following sequence:

1. pedagogical and psychological group and individual observations and tasks (5 credits);
2. group and individual teaching practice under UPS mentors, mathematics in one semester and the other subject in the other semester (3 credits per subject) (using the collaborative practice model, this means 3 hours of group collaboration each week plus the observation and teaching of two batches of 15 lessons, the last lesson for each subject being the teaching examination);
3. individual school teaching practice under a mentor in an ordinary school for the last two weeks of each semester (2 credits per subject), when 25 lessons are observed and taught in each subject.

The structure of university courses is similar to that of college courses but consists of 300 credits for the five years. Teaching practice is an option in the last, fifth year (10 credits per subject) and consists of both UPS practice and a longer practice in an ordinary school.

Two collaborative subject teaching practice models

The traditional model

In our college’s practice schools there was a model used from the 1960s to the early 1990s where 12 trainees on average were assigned to one UPS mentor for both mathematics and the other subject during the sixth semester (February–May) and the seventh semester (September–December).

The 3-hour mathematics group days each week in the sixth semester consisted of the lesson observed by the group, then its discussion, and then preparation for the next group day.
The theme, curricular and class-specific information, the main aims and didactic tasks of the lesson were discussed briefly by the mentor for the lesson two weeks later and each trainee had to produce a draft lesson plan, handing it in two to three days before the next group day. The mentor read, corrected and commented on each plan and gave them back to the trainees at the start of the next group day. In the preparation session, first the mentor briefly evaluated each lesson plan, then the trainee and their buddy (trainees worked in pairs) presented their plans, ideas and methods. After the other trainees had contributed their ideas to the mentor’s suggestions, experiences and moderations, the trainee summarised the changes they would make on the plan. The trainee and buddy then prepared a detailed lesson plan, discussed and agreed by the mentor before the group day teaching.

During the lesson, each group member had to write down the lesson process, points noted, questions and remarks. Aside from this, there were special points to observe, set by the mentor in advance. Classically, in this sixth semester, observation was planned to evolve gradually from one or two viewpoints at the start to a complex observation and evaluation.

The review of the lesson began with a report and self-evaluation by the trainee who had taken the lesson, relating what actually happened to the aims and tasks planned. Then the buddy reflected on the lesson, followed by each of the other trainees. The discussion was led by the mentor, either as an open discussion or (since trainees were frequently asked to bring to bear their pedagogical–psychological theoretical knowledge and embed it in concrete practice) focusing on assigned viewpoints. Each group member would contribute. In addition to the two group days per week, the 12 trainees were allocated individual teaching practice for two-week periods where they observed and taught lessons in both subjects and did some other school work (class-leader lesson, afternoon school, administration, etc.). So most of the time, two trainees were with each mentor. Since the practice school mentors had 12 obligatory lessons per week, it was difficult for the two mentors to organise their work and to give the required number of lessons to pupils. Trainees frequently observed their buddy’s lessons instead of the mentor’s lesson. For the trainees, this two-week two-subject training stint was exhausting, mainly because they had to show each lesson plan to their mentors in advance.

The differences in the seventh semester were 2-hour group days (with no group lesson preparation) and shorter preparation sessions with the mentor for individual practice, working towards independence.

In the final eighth semester, trainees went to ordinary schools for one month’s individual practice (February), then returned to the practice school to take their teaching examination in both subjects. A trainee might teach the previous lesson to the class in the UPS before teaching the actual examination lesson.

The current (reformed) model

The traditional model has been changed in several ways. The two subject teaching practices are separated from each other in the seventh and eighth semesters, so the trainees, during their individual practice in, say, the mathematics semester, can concentrate on mathematics teaching.
Six trainees are assigned to a mentor and the individual practice period lasts for three or even four weeks if necessary. More trainees can meet and observe each other’s lessons and can be involved in informal discussions, which is fruitful. It is easier to schedule the trainees. Trainees are less tired.

The 3-hour group days are similar in theory, but about half of those lessons are also examination lessons (at the end of the individual period) and this has a negative impact, since the gradual building up of lesson analysis abilities cannot be sustained. After the examination lesson, the need to participate in the remaining group days and the last two-week practice in ordinary schools might be questioned. However, because of the examination lessons, tutors’ participation in group days is more frequent, which is again positive.

However, the UPS system is expensive and privileges should be given to UPS schools and mentors for the extra responsibilities they undertake in training teachers.

Placing such advanced aspects of training in partner schools (outside UPSs) will not be easy. Lesson reduction for one or two mentors in a school and assigning between three and six trainees to each mentor (for three or four weeks of individual practice and weekly group days) might be a solution if there is sufficient support from other expert teachers in the school and from university tutors. Schools that have several successful mentors could become ‘methodological base schools’ or demonstration schools, where a collaborative inservice training (continuing professional development) model could also be instigated.

**Long-term thoughts**

The UPS system has advantages in the first phase of teaching practice, with its formal group days and first phase of individual practice, as long as with frequent help from university tutors, expert UPS mentors can gradually guide the trainee teachers towards independence and the pedagogical–psychological and subject pedagogical theory can be embedded in practice.
Joensuun normaalikoulu, the University Practice School (UPS) at Joensuu, is situated in North Karelia in the eastern part of Finland. The school is a state-financed practice school – a professional development school – that administratively is a part of the Faculty of Education. University-owned primary and secondary schools such as Joensuun normaalikoulu are a special feature of the organisation of Finnish teacher education. The general aim of this internationally unique provision is to strengthen the link between instruction and research and to integrate the theory and practice of teaching.

Above all, Joensuun normaalikoulu is a regular school that offers primary and general secondary education to its pupils. The school includes both a comprehensive school (age group 7–15) and senior secondary school (age group 16–18). Joensuun normaalikoulu also has special responsibilities pertaining to the teacher education provided by the University of Joensuu. These responsibilities include:

- planning the programme for trainee teaching and guiding and supervising the trainees in their teaching practice and professional development;
- developing primary and secondary school curriculum and instruction through experimental programmes, development projects and research work;
- providing short-term inservice training and refresher courses for teachers in comprehensive and secondary schools.

These special responsibilities are shared with the Faculty of Education. Major experimental programmes are carried out in collaboration with the National Board of Education and may require the approval of the Ministry of Education.

There are 940 pupils and 80 full-time teachers in Joensuun normaalikoulu. In the academic year 2004/05, there are 350 pupils and 27 teachers at the lower stage of the comprehensive school (pre-school group and grades 1–6). At the upper stage of the comprehensive school (junior secondary school, grades 7–9) there are 240 pupils and in the senior secondary school there are 350 students and 55 teachers. All the three stages are ‘schools within a school’.

Joensuun normaalikoulu has three separate school buildings. The upper stage of the comprehensive school and the senior secondary school use the same building. The lower grades have two buildings. The pre-school group and the first two grades share their building with Itä-Suomen koulu (the School of Eastern Finland, specialising in teaching Russian), maintained jointly by...
the state and the town of Joensuu. From the architectural point of view all the buildings are planned to support the modern idea of learning environments (for example, a spacious study hall in the centre of the building). The whole school is situated in the campus area of the University of Joensuu, offering all the services of the university, including its library. Various sports facilities are easily available, as well as the natural environment, both of which are used in out-of-school education. In the near future the grades 1–6 will have a renovated school building.

A considerable part of the teachers’ work in Joensuun normaalikoulu is being a teacher educator. The teachers are required to have higher than usual qualifications. About 95% of the teaching staff have at least a Master's degree. Seven teachers have a postgraduate degree and close to 20 teachers are working on postgraduate degrees and doing research work. Several teachers have published school books and guidebooks for teachers. Many of them are also nationally known experts and lecturers in their field.

The teacher education provided by the University of Joensuu is exceptionally extensive both in numbers and in scope. The university faculties educate subject teachers and student counsellors for the comprehensive and the upper secondary school as well as class teachers and special teachers for the comprehensive school. All these groups of trainees participate in guided and evaluated trainee teaching at the UPS. Each year there are about 350 trainee teachers working in Joensuun normaalikoulu. The quest for flexible and more broadly-based teaching qualifications will present both pre-service and inservice teacher education with many opportunities.

The trainees work together in subject groups, observing and reflecting on the expert teachers initially and then working collaboratively in their own preparation and evaluation. The trainee teachers not only have to gather peer evaluation of their lessons, but also from the pupils in the school.

A recent agreement between the University of Joensuu and the Ministry of Education states that Joensuun normaalikoulu as a university school will pay special attention to developing the use of information technology in instruction, the teaching of mathematics and physics, and providing possibilities for research in these areas as well as in learning theories. In autumn 1999, a special department was founded in the senior secondary school to widen the teaching of this field.

Furthermore, the whole school puts emphasis on developing environmental and science education, participating in the national programme LUMA (national joint action for developing Finnish knowledge and know-how in mathematics and sciences 1996–2004). A similar programme, KIMMOKE (diversification of language teaching 1996–2002), runs throughout the school, emphasising curriculum development, evaluation and international connections.

The pre-school and primary education teachers work together to develop curriculum and learning material in their field. The senior secondary school of
Joensuun normaalikoulu is participating in a national experimental programme aiming at creating flexible and individualised study programmes. All these areas can benefit from the wide range of expertise represented in the university’s various departments.

Joensuun normaalikoulu also cooperates with other UPSs in Finland and with the National Board of Education on experimental programmes and development projects. The school is a UNESCO school, actively building up network cooperation based on modern information technology with various European schools.
Despite recent educational reforms and increased accountability for educationalists there still seems little progress in implementing more effective strategies for teaching in school.

Earl et al. (2003) in their final report on the English National Literacy and Numeracy Strategies report that the intended improvements in the classroom are not deep and Fullan (2003) argues that they are only the first steps in terms of deeper reforms that are required for the twenty-first century. Cohen and Hill’s (2001) study of California’s attempt to change and improve mathematics teaching illustrates the challenge for these future reforms. They argue (p. 6) that three ‘policy instruments’ in combination resulted in improvement: curriculum, assessment, and teacher learning. Commenting on the present practice in relation to the issue of teacher collaboration and learning, the authors comment (pp. 11–12):

‘Professional contexts are likely to bear on teachers’ ideas and practices only when they create or actively support teachers’ learning of matters closely related to instruction, and most professional collegiality and community in American schools is at present disconnected from such learning.’

The international research evidence that is available on the effectiveness of continuing professional development (CPD) programmes is far from encouraging. Despite all the effort and resources that have been used, Fullan (2001) and Joyce (1992) report that the impact of such programmes in terms of improvements in teaching and better learning outcomes for pupils are disappointing. Fullan argues that some of the reasons for the failure of inservice training are: one-shot workshops are ineffective; topics are often selected by people other than those for whom the inservice training is provided; follow-up support for ideas occurs in a minority of cases; follow-up evaluation occurs infrequently; programmes rarely address individual needs and concerns of participants and there is no recognition of the different impact of factors within the system to which participants must return.

Joyce and Showers’ (1995) work on staff development and in particular their peer coaching approach has changed thinking about CPD. The authors identify a number of training components which when used in combination have a much greater power than when they are used alone. The components of training are:

- presentation of theory description or skill strategy;
- modelling or demonstration of skills or models of teaching;
- practice in simulated and classroom settings;
- structured and open-ended feedback (provision of information about performance);
- coaching for application (hands-on classroom assistance with transfer of skills and strategies in the classroom).

Joyce (1992) also distinguishes between two elements of teacher development activity – the workshop and the workplace. The workshop, or the traditional INSET course, is where understanding is developed. If, however, the skills are to be transferred to the classroom, Joyce suggests that on-the-job support is
required in the workplace. This implies changes to the way in which staff development is organised in our schools, and in particular, opportunities for sustained practice, collaboration and peer coaching. There is an interesting parallel here with the experience of school improvement in Japan, reported in *The Teaching Gap* (Stigler and Hiebert, 1999). The authors draw on the conclusions on the Third International Mathematics and Science Study (TIMMS) – a study comparing teaching in the USA, Germany and Japan – to refocus educational efforts.

The study describes the professional development activities of Japanese teachers who adopt a problem-solving orientation to their teaching. According to Stigler and Hiebert, the major form of professional development is yugyou kenkuu or ‘lesson study’. In lesson study, groups of teachers meet regularly over long periods of time to work on the design, implementation and testing of one or several ‘research lessons’.

Stigler and Hiebert maintain that the premise behind lesson study is simple: ‘... if you want to improve teaching the most effective place to do so is in the context of a classroom lesson. The challenge now becomes that of identifying kinds of changes that will improve student learning in the classroom and once the changes are identified, of sharing this knowledge with other teachers who face similar problems, or share similar goals in the classroom.’

A key element of Japanese teachers’ success is their process of lesson study, which is as follows.

- **Choose a research theme.** A group of teachers works together to come up with a research theme. This theme focuses on a broad research question regarding their pupils that involves skills or attitudes they would like to foster, for example how to increase independent thinking in pupils in mathematics.

- **Focus the research.** The teachers select a goal and unit of study to focus on and research their pupils’ abilities within this unit of study.

- **Create the lesson.** The teachers then select a lesson within the unit to develop, and follow an established lesson plan template.

- **Teach and observe the lesson.** The lesson is taught by a member of the group and observed by the other group members. The focus of the observation is on pupil thinking, not on the teachers’ abilities.

- **Discuss the lesson.** The group then gets together to discuss the lesson and their observations.

- **Revise the lesson.** Revisions are made to the lesson, based on the observations and analysis, and another member of the group is selected to teach the lesson again. The process of observation, discussion and revision is repeated.

Lewis (2002, p. 5) comments that *The Teaching Gap* sparked interest in lesson study among teachers, researchers and educational policymakers in the USA and states that lesson study has been the focus of several state, national and international conferences of classroom educators; has attracted more than 400 educators from across the USA to several lesson study open-houses; has been cited by several high profile policy reports; and has a special journal issue devoted to it.
There is now substantial interest in lesson study in both the USA and in the UK with the National College for School Leadership (NCSL) promoting the practice. However, the current interest in lesson study evokes memories of other innovations that were only partially understood, undersupported, poorly implemented and then discarded (Fullan, 2001). For lesson study to have a chance of deep implementation Lewis (2002) believes that educators need to find the answers to the following questions.

- What are the essential features of lesson study that must be honoured when lesson study is conducted (and what are the non-essential features that can be changed)?
- How do educators improve instruction through lesson study?
- What support will be needed for lesson study given its educational system and culture?

Stigler and Hiebert (1999) suggest that any research and development system that is constructed to improve teaching over time must start small but also must be able to expand. They also suggest that there must be a clear means of growing the system into one that can serve the nation as a whole and suggest three policy initiatives for success.

- **Build consensus for continuous improvement.** Although teachers are essential for success there must be involvement from the very top to lead the initiative. To be effective, superintendents (CEOs/DoE), school boards (governing bodies) and principals (headteachers) will all have a part to play. The authors suggest that in order to build consensus around a slow, gradual improvement for all stakeholders, outcome measures must be developed that are sophisticated enough to detect small changes in pupil learning and to differentiate such changes from random fluctuations.

- **Set clear learning goals for pupils and align assessments with these goals.** Not only must there be clear goals, but if teachers are going to collaborate to find ways of improving instruction the goals must be widely accepted.

- **Restructure schools as places where teachers can learn.** If we expect teachers to play a major role in improving instruction, then we need to provide them with an environment in which they can do this work. Unfortunately, the vast majority of US schools are not suited to this purpose. Teachers work alone for the most part and have little time to interact, much less collaborate.

The practice of lesson study in both Japan and the USA as described in this paper, although different in structure, is similar in ideology to the collaborative practice model advocated by David Burghes and his team at the Centre of Innovation for Mathematics Teaching, which will be a central focus in the forthcoming National Centre for Excellence in the Teaching of Mathematics.

In summary, I will leave you with a vision of the future as described by Stigler and Hiebert (1999).

‘The star teachers of the twenty-first century will be those who together infuse the best ideas into standard practice. They will be the teachers who collaborate to build a system that has the goal of improving students’ learning in the “average” classroom, who work to gradually improve standard classroom practices. In a true profession the wisdom of the profession’s members finds its way into the most common methods. The best that we know becomes the standard way of doing something. The star teachers of the twenty-first century will be the teachers who work every day to improve teaching – not only their own, but that of the whole profession.’

References


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