The delivery of technology content in one-year initial teacher education partnership schemes

Glyn W Price and David J Reid
University of Manchester

Abstract

This paper describes a model for the delivery of Technology subject content in the new teacher education partnership arrangement starting in 1993. It is based upon the scheme initially tried with articled teachers and which has now been further developed. The University of Manchester model of initial teacher education is based on the principle of empowerment of the classroom, laboratory and workshop teachers in the mentor role, rather than the use of a top-down model in which the school senior management pass the training through the hierarchical structure to the student. The simple subdivision of the work of the higher education institutions and the schools into theory and practice has been shown to be unsatisfactory. It is shown how the two partners in the scheme can jointly improve the quality of the teacher education provided for the students by allowing the students to be the auditors of their own progress; it is shown how individualisation of the students' programmes can be very effective in optimum use of their time and in reducing unnecessary repetition.

Introduction

One year postgraduate courses of Technology Initial Teacher Education (ITE) have faced problems of content coverage with the introduction of the National Curriculum in Technology. Recruitment of able graduates has, for many institutions, been especially buoyant over the past few years, but these graduates in the main have narrow specialisation when seen from the breadth of the National Curriculum subject content. This is true, not only with regard to the first version of the Technology National Curriculum, but also with regard to the proposed amendments and revisions in hand at the time of writing. The idea that a graduate joining a course for training has already mastered the subject content across the National Curriculum cannot be upheld. The mismatch is a function of the breadth of the National Curriculum and the fairly narrow specialism of most of the degree courses deemed to be relevant starting points for that training. Thus there is a need for content studies to be a significant part of any course of teacher education in Technology. (It may be that in some other subjects, it is reasonable to assume that the students' subject knowledge covers most of that which the newly trained teacher will need to call upon, though Science shares Technology's problem of coverage to some lesser extent.) It is likely also that the need to continue to change the mode of content delivery as part of the task of keeping Technology up-to-date will remain a feature of this subject area for the foreseeable future.

The University of Manchester, in partnership with the Wigan Local Education Authority (and for some educational issues and some second-subject work with the Manchester Metropolitan University) has provided an Articled Teacher course in Technology since 1990, which has given a base for research into methods of delivery of Technology content (Lumb *et al*., 1991, Price and Mason, 1992, Mason and Price, 1992). This scheme is not directly comparable with the new partnerships between schools and higher education, the Articled Teacher scheme having the opportunity for LEA based activities which the UK government has written out of the new arrangements (DFE, 1992). For this and other reasons there are fundamental differences in the roles of the mentors. (Also, in the North-West Consortium Articled Teacher Scheme, of which the Wigan programme is a part, the training of mentors was focussed at the administrative level, rather than at those Heads of Department and teachers who will interact most with the students.) The Articled Teacher Scheme has, however, been an extremely valuable opportunity to experiment with the development of delivery arrangements on a subject-specific basis.

This article is concerned with the design of an overall curriculum strategy to cope with the variety of pre-course experiences of the students, the reduced University-based time in the new school-based programmes, and the expectation of continual change in the form of content in the Technology National Curriculum.

Basic Concepts of the Manchester University Initial Teacher Education Partnership

In over 100 years of ITE, the School of Education has developed close working relationships with hundreds of secondary schools in the Greater Manchester conurbation, together contributing to the rich variety of educational philosophy and pedagogy that has traditionally been available to our students. We did not wish to impoverish the potential of that provision but, at the same time, were conscious of the strictures that government directives imposed upon us:

- that schools should play a significant (even 'leading') part in the design, provision and assessment of ITE courses and students;
- that 'students undertake similar tasks and gain similar experiences, wherever their time in school is spent'; and
- that it was a function of HEI that it ensured the quality control of the course.

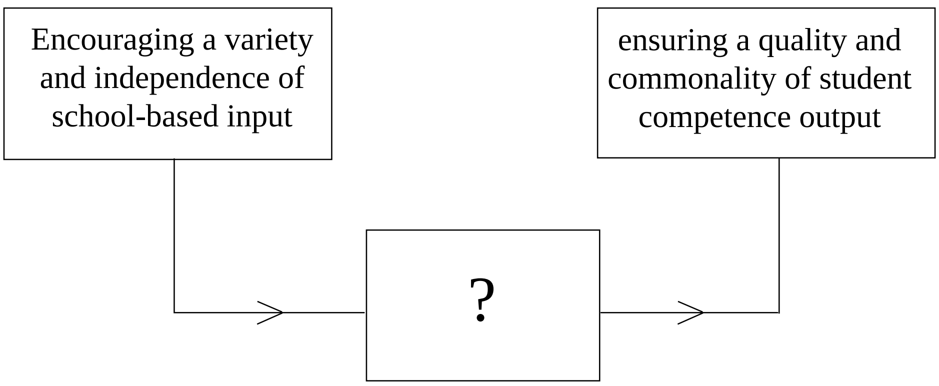
Initially it seemed that professional decisions to retain a rich variety of provision coupled with empowering classroom teachers to take responsibility for this provision did not sit easily with the latter two directives in the above list. There is an apparent inherent conflict in encouraging independence of provision across a wide spectrum of partner schools (freedom of input) on the one hand and controlling the output (in terms of commonality and quality) on the other hand. This is summarised in the diagram below.

The ingredient which was to provide the linkage between the two sides of the model, the '?' in the diagram below, was to be the students themselves, supported by appropriate documentation.

There are two main structures essential to such a model of ITE, each with its supporting documentation, one associated with the left-hand side of the model above, and one with the right-hand side.

The first structure is the Training Curriculum; each mentor was required to write a Training Curriculum. This was to be unashamedly and explicitly based on the unique philosophy that each mentor would bring to the training programme. Mentors were required to work to these strengths. Their Training Curricula described the classroom, departmental, school and community provision that the student could expect to receive week by week of the Course, and was validated by the University on the basis of eight holistic criteria agreed between the University and the mentors during training:

- a statement of mentor role (this would vary from school to school - the important thing is that school, university and student were aware of what it was to be in any particular school);
- evidence of qualitative and quantitative progression of student experience through the year;
- inclusion of specialist provision the school could make (exposure to gifted children, industrial experience, provision of exceptional technology equipment, etc);
- evidence of coherence between the provision made by the University and that made by the school;
- the variety of pedagogical experiences to which the student would be exposed;
- procedures for conferencing students;
- statements about which competences would be addressed, and when;
- procedures for formative (diagnostic) and summative assessment.



In this way every mentor's Training Curriculum would maximise the unique nature of its individualised provision, and the student would be aware of what he or she could expect from any particular school experience.

The second structure is the Record of Achievement and Development (RoAD). Each student is provided with his or her personal RoAD document, outlining the competences required of newly qualified teachers. This included not only the minimal competences laid down by government, but additional competences which the mentors, in their contribution to the design of the Course during the training programme, also felt were important. Each competency was defined by:

- a number of criteria which *prescribe* competence
- a number of criteria which *describe* competence, and
- a number of action statements which *evidence* competence.

There are not many prescriptive criteria, but where they exist they are very important since, if not achieved, any one of them would result in outright failure of the Course. For Technology students, lack of evidence that a student could work safely in workshops or laboratories with children would prescribe failure. By contrast, there are many descriptive criteria attaching to each competency, and the number achieved would be an indicator of the level of competency achieved. Finally, examples of student behaviour indicate the kind of evidence that mentors and tutors would be looking for in deciding the level of competency achieved. During frequent conferencing sessions the mentor, tutor and student agree on future targets to be set and achievements made, and both of these are recorded in the RoAD.

Clearly the students play a vital part in this model of ITE. Without their active and confident involvement, searching out and even demanding promised provision from an appropriate source, and recording it in the RoAD document, it is difficult to ensure the kind of quality control demanded of the Course. This becomes especially powerful in delivering the wide-ranging competences required in Technology.

During the Spring term students move from their partner school to spend six weeks in a second school. Clearly the choice of this second school will depend upon the kind of experiences that the student will have had in the partner school. There is never any attempt to insist that a partner school makes any provision above and beyond that to which they have voluntarily committed themselves in their Training Curriculum. An obvious example of choice of second school would be where a student had spent partner time in a post-16 institution. Clearly in this case there is a prime need for the student to work at key stages 3 and 4. The final two weeks of the Course allows students to work in a third school. Originally designed as a specialist SEN provision, it is likely that this will become a 'top-up' experience. The third placement will be selected to help the student overcome any obvious weaknesses in the RoAD documentation.

At the end of the Course a summative list of competences is available for informing the needs of the student's induction year INSET training programme.

Specific Problems of ITE Curriculum Design in Technology

In order to design an effective postgraduate course in Technology ITE we have to remain conscious of the particular needs of the schools which will eventually employ the trained teachers. The supply of teachers with a leaning towards traditional subject components (home economics, CDT, computing, etc.) has been maintained well through the traditional BEd courses, especially where those institutions have not forfeited their traditions of quality of skills development in the search for generality of coverage of the National Curriculum. Such courses have time on their side, with four years in which to ensure that adequate content has been included and that students have adequate opportunity to develop skills to a high level. However, it is pertinent to ask whether the traditional subject divisions are still relevant in reflecting the needs of the schools tackling the new National Curriculum in Technology, or whether the introduction of the National Curriculum has changed the basic description of what is needed in a newly trained teacher. The answer varies much from school to school. (For example, some schools locally are reporting a particular shortage of generally trained Technology teachers for KS3 who also have a specialism in Control Technology at KS4 and beyond.)

In one-year postgraduate courses there is a conflict, because of the limited training time, between gaining particular expertise in, say, CDT against the timetable flexibility given by a person trained with a mixture of skills, albeit at the cost of reduced attention to specialisation. Ideally, both aspects are required: maximum breadth at KS3 and at least one full specialism through to KS4 and beyond. The breadth of subject knowledge will also give the student an understanding of the broader activities of the whole school technology department.

It is desirable that an educated new teacher will have areas of specialisation with up-to-date knowledge and experience to add to the pool of expertise in the school. To this end the student must be given opportunity to become quite 'expert' in at least one area of specialisation. In the National Curriculum it is important that the team nature of technology provision is fully recognised. Each teacher will have competence for delivery over a particular range of activity, but will also act as consultant to colleagues over a narrower range.

In parallel with this, the efficient use of students' time requires that they do not spend time and energy in repetition of training which they have received prior to the course. (Good examples may be found in the information technology and computing field.) Set against this, the cost effectiveness of training requires that the inherent scale economies of group teaching in the higher education institutions are not lost in the new school based systems. (The crude all-school apprenticeship model also lacks the opportunities for some of the important student group interactions which form a particular advantage of the higher education component.)

An attempt for an institution to produce a 'standard' Technology teacher is as illogical as it is impractical. There is no 'standard' school staffing, even with a national curriculum. Furthermore to produce a 'monochromatic' teacher, highly specialised but with inadequate breadth of understanding, is almost as big a disservice to the schools as it would be to produce broad generalists with no quality or depth of skills to offer to the pupils.

Individualisation of the Training Programmes

The individualisation inherent in the whole concept of school-based training, and the personal attention of a school mentor (if that is concentrated at the departmental level) in parallel and in close collaboration with a University tutor give this model a new impetus. It may be noted that our 'old' PGCE programme had about 60% school-based work in the one-year Technology scheme, as compared with the 80% of our articled teacher scheme and the 67% minimum demanded by government in the new scheme. It is not the major shift it is made out to be in some quarters.

Our models of training (both for the Articled Teacher Scheme and for the new school-partnership scheme) have therefore focussed on developing in each student a 'spectrum' of skills and levels of appreciation (at a personal level) which are appropriate to that student's educational background, intended career interests, and other attributes such as industrial experience. This means that students must be treated much more in terms of their individual needs, rather than by provision of a training with common content for all. This has worked very well in the Articled Teacher scheme and is been the basis for recent improvements in the one-year PGCE course. It works especially well in delivery of the content, skills and subject knowledge of Technology.

Though it works well, there is a need to meet that requirement of government in the partnership programmes that 'students undertake similar tasks and gain similar experiences, wherever their time in school is spent'. For Technology we therefore have to work to a common system of achievement audit, which requires extension of the RoAD document into specifics of content knowledge, skills and selected broader experiences. This is not in itself a problem, though in those cases where participating schools find themselves constrained in the provision of experiences which are part of our 'common core' it is necessary for the University to be prepared to make good those deficiencies.

The individualisation works at several levels. The first relates to the delivery of the basic knowledge, skills and appreciation to enable them to join effectively in a broad-based Technology Department or Faculty in the school, able to communicate knowledgeably in a common language and with common understandings with colleagues. (In the context of the National Curriculum this is important if the school is to fulfil its basic obligations regarding the pupils' entitlement to a balanced approach to Technology.)

The second level is to ensure that the newly qualified teacher has efficiency in teaching across a number of areas at KS3, and at least one skilled specialism at KS4. Unless there is good reason otherwise in an individual case (such as strongly held views of a student regarding career intentions) then it is desirable that the specialism be further developed for post-16 education, and this also requires audit. Thus the concept of a range of abilities, understandings and knowledge at different intensities across the subject area and for differing pupil groupings is established.

The audit must ensure that the abilities of the teacher-to-be are to be built up, using broad foundations, with progressively narrower specialisation as the standard and potential for application for leadership increases.

As a first example of the move to student audit of content we may look at the skills development programme. Each student is provided with a document listing desirable attributes for a KS3 teacher, ranging over procedures, skills, safety knowledge, etc. The student can then discuss with mentor *and* tutor the personal development programme needed. Some of these will be delivered in group activities and classes in the University for the benefit of the scale economies or specialist expertise available, some will be delivered in the schools where access to equipment for practice (when pupils are not using it) and personal advice from an experienced teacher can be optimised. Most situations require, for best effect, a combination of *both* providers. For example, in the Articled Teacher scheme the delivery of electronics included the option of initial electronics education practical work in the University, provision of technical instruction by the LEA and experience of implementation in the individual schools. Graphics work, initiated with a group discussion in the University of the standards expected from course members and pupils in the schools, was followed up by students' work in the schools, individual practice in private time, and experimentation in the classroom with pupils who were developing their own graphics capability. Some very good work ensued.

We here come to the main problems. Do we then have the control necessary to provide the assurance of *quality* essential to maintaining Technology teacher professionalism? Are the students yet mature enough to accept some of the responsibility for control and audit of their own progression? The answer has to be twofold; they need support through the RoAD document, frequent conferencing, support in specific tasks and regular guidance from the mentor and tutors working in close collaboration. Our experience is that, given the level of support described the new system has every chance of being an improvement on the former systems; but it is more costly in time and thus in economic terms. This was also the lesson learned through the Articled Teacher Scheme.

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