

# Is it possible to ensure the survival of primary design and technology through ten hour courses?

*Maggie Rogers, Coordinator of Primary Design and Technology Courses, Department of Educational Studies, Goldsmiths, University of London*

## Abstract

The title of this article refers to one of the main issues facing primary design and technology (D&T) education at the current time. The lack of time given over to D&T for primary teachers in training is also critical, as some students will graduate with less than ten hours experience of design and technology, some with none at all since the introduction of 'either/or' subjects in the initial teacher training (ITT) curriculum. If preparation for teaching the subject is minimal in ITT, is there an alternative?

The proviso in the TTA Standards of support in D&T from experienced teachers for newly qualified teachers (NQTs) needs closer scrutiny:

*"to be able to teach them to their intended age range in their first year of teaching, with the support of an experienced teacher where necessary" (2002 2.b).*

One could presume that this task would fall on the shoulders of the subject leader. This article reports on a study which set out to find out how realistic the provision for support suggested is and what support is available for those on whose shoulders the responsibility will fall.

What emerges from the study are enthusiastic and committed subject leaders who are getting variable support due to the lack of investment in advisory services. While it is not uncommon to meet NQTs who have had no preparation to teach design and technology, teachers were interviewed whose knowledge and understanding of their design and technology subject specialism in training is having a significant impact on the practice in their schools. However, interviews conducted as part of the study also exposed the general lack of understanding of what design and technology is, the purposes of the activities and the differences between design and technology and science activities.

## Background

As developments in the primary curriculum for England have taken place, for example, the introduction of the National Literacy and National Numeracy Strategies and the development of the National Grid for Learning, the place of National Curriculum foundation subjects has been reduced to a level where student teachers have difficulty in observing the teaching of, let alone practising in, areas such as design and technology. An alternative title for this article might be 'Primary design and technology is alive and well but deserves a mention'. The inclusion of other specific foundation subjects in developing 'excellence and enjoyment' through the new Primary Strategy in the curriculum is to be welcomed but the lack of a specific mention of D&T is worrying.

In studies conducted prior to the implementation of the revised National Curriculum in 2000, Davies and Rogers were able, through a number of case studies and surveys, to show the trends emerging from government directives to schools to suspend requirements for foundation subjects in 1997 (*What has happened to primary design and technology? – student teachers in search of a foundation subject*, presented at BERA 4th September 1999). This presentation led to a further study conducted by four HEIs presented at the DATA Millennium Conference: *Carrying the Torch - can student teachers contribute to the survival of design and technology in the primary curriculum?* and was subsequently published in the conference proceedings. In both these studies, tutors monitored the perceptions and experiences of student teachers during their school experience placements in endeavouring to fulfil their course requirements for teaching D&T. These students, specialists in D&T or otherwise, are now in their fourth year of teaching.

Since the first cohort of specialists in D&T graduated in 1992, a further 200 have completed either the four-year or the three-year course which followed it.

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

Having survived the revision of the National Curriculum in 2000, D&T in the primary school is again under threat. The revision of the circular 4/98 by the Teacher Training Agency (TTA) made D&T an 'either/or' subject against art and design for trainee teachers. The impact of this is compounded by the requirement for specialist subjects in training being dropped. In revising the BA(Ed) Primary at Goldsmiths, University of London, an introductory course for all the Foundation subjects followed by optional courses has been retained.

The effect of minimal courses was highlighted by one of the D&T subject leaders interviewed during this study where the teacher had no memory of D&T courses during initial teacher training. The subject leader went on to report that the other staff were in a similar position: *"taking what they have been given as a model but lack the basic subject understanding"*.

These teachers are teaching *"D&T to the best of their ability thinking that what they are doing is correct unless shown otherwise"* (SSL33/1)\*.

The confusion about what is design and technology was highlighted by an CPD provider interviewed for the study who gave as examples, teachers doing textiles: *"might consider it D&T when it isn't because there is no purpose or need being addressed"* and *the making of Tudor houses where the activity is really a focused practical task rather than a design and make activity* (IP43/1)\*.

The impact of the revised standards for initial teacher training makes it imperative that developers of primary teacher training courses consider a longer term approach to ensuring the survival of such vital aspects of children's education as design and technology in the 3 – 11 age range.

**\*These coding systems are explained in the following section on research methodology**

### Methodology

The initial intention of this study was to focus on a local perspective on the following issues:

- teacher perceptions of D&T education;
- the nature of support perceived as necessary to develop the practice of D&T;
- the impact that specialist students have had on the D&T practice in the schools.

A survey was carried out during the Spring term of 2003 amongst design and technology subject leaders (referenced in the article by the letters 'SL') in four local education authorities. This was to establish teachers' perceptions, not only of the subject but also of the nature of support perceived as necessary to develop the practice of D&T and ensure its survival. In addition, semi-structured interviews were conducted with in-service training providers (IP) which included local education advisors, higher education tutors and specialist teacher centre staff.

Teacher perceptions of design and technology education were accessed largely through questionnaire responses from subject leaders during three network meetings for design and technology coordinators within the area covered by the Primary Partnership at Goldsmiths, University of London. These responses were supplemented by attendance at another network meeting outside the London area, where further questionnaires were filled in, providing additional, geographically different perspectives on the issues.

Tracking past subject specialists (referenced in the article by the letters 'SSL') proved to be very helpful in providing case studies to demonstrate the impact of their training and experience on the D&T practice in their schools. Semi-structured interviews were carried out with these and two DATA Leading teachers (referenced by the letters 'LT') who had graduated from DATA/TTA extended courses. Additional interviews were held with two NQTs who had specialised in D&T during their training (referenced by the letters 'SST') and two

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

teachers who were not specialists in D&T (referenced by the letters 'NST') but were nevertheless very willing to share their experiences and perspectives. Enlisting volunteers to contribute to this study was not difficult, and any requests made at Partnership Cluster meetings, network or advisory group meetings were warmly supported. This, in itself, demonstrates the commitment of the primary D&T community.

The survey of subject leaders for design and technology was conducted during four network meetings, the largest group of teachers being twenty-six, the smallest three. After a short introduction to the study and the issues being addressed each teacher was given a questionnaire to fill in. Overall, fifty-five responses were collected in this way. In addition discussions were held with colleagues from five ITT providers.

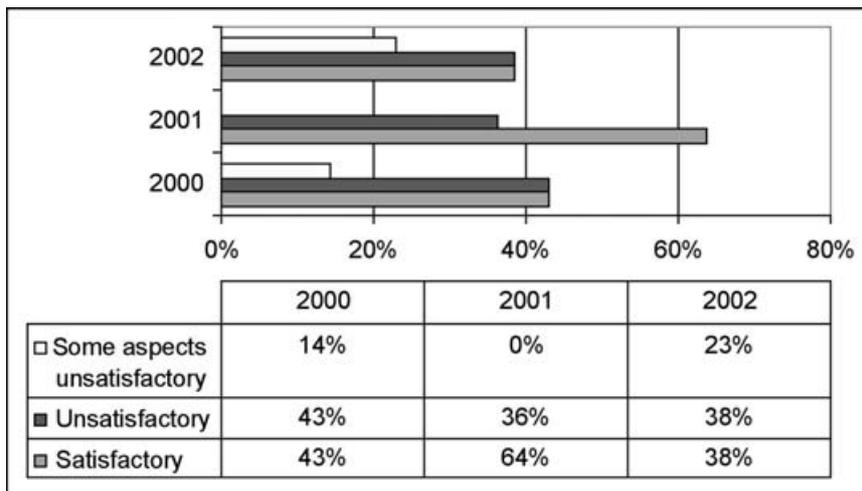
The questionnaires for the subject leaders covered the areas of concern by asking the following questions:

- How is the teaching of design and technology organised in your school?
- Do you follow the QCA/DfEE schemes of work? If yes, what are the most popular units in your school?
- What, in your opinion, has had the biggest single impact on the teaching of design and technology in your school?
- In the absence of CPD provision, what strategies could be employed to support the development of design and technology education?
- What do you consider to be the minimum experience of design and technology a newly qualified teacher would need to be confident to teach the subject area?

In addition, Ofsted reports for schools within a two-mile radius, during the 2000 – 2002 rounds of inspections, were analysed to identify what the standard of design and technology was judged to be. This data highlighted examples of perceived good practice as well as areas of concern in the teaching of design and technology. From the Ofsted reports it is clear that, in these schools, design and technology was judged as being satisfactory in around 60% of schools inspected in 2001, falling to 38% in the 2002 inspections. These reports drew attention to time for developing the subject; teachers' subject knowledge; the role of the coordinator; resources; assessment; monitoring of scheme of work; systematic guidance for teachers and the prioritising of the subject in the school.

The chart below (Figure 1: Analysis of Ofsted Reports) describes a situation where 40% of the schools are, at present, working to develop their design and technology to a satisfactory level. In one Ofsted inspection it was noted that where teachers were confident about what should be taught and how they could best support the pupils' learning, teaching was good and pupils made progress. In response to the dropping of subject specialisms from the TTA Standards and the choice student teachers have to make between design and technology and art and design during their training questions have to be asked about where they will gain support. Do teachers in school have time and the experience to support newly qualified teachers to develop their practice?

## Is it possible to ensure the survival of primary design and technology through ten hour courses?



**Figure 1: Analysis of Ofsted Reports**

One of the CPD providers interviewed for this study indicated a three-year period from 1999 – 2001 when no requests for in-service training were received until one Headteacher made contact after an Ofsted inspection. This led to many other requests, often for the same sessions for the following year. These repeated requests for the same sessions, mostly working directly with the children, may indicate the lack of confidence within the school to carry out the activities as much as the high quality of the sessions (IP122/1).

This lack of confidence may be in some way caused by lack of knowledge and understanding of the subject. The impact that this has on the teaching of design and technology was highlighted in the main findings of the 2001/2002 Ofsted subject report where it states that the *“quality of teaching of D&T is adversely affected by substantial shortcomings in teachers’ knowledge and understanding”* (Ofsted 2002 p3). The same report recognises the difficulties of appointing well-qualified coordinators from outside the school which results in subject leaders who *“lack the necessary subject knowledge and authority to discharge their role effectively”* (Ofsted 2002 p4). Whereas prior to the introduction of the National Literacy and Numeracy Strategies Ofsted was the driver for course attendance, now it tends to be internally driven, for example being identified by the school in their school development plan (IP33/1).

A significant issue arises when considering whether or not schools are going to be able

to address the issues identified in the subject report.

*“Good subject leaders are needed to influence the quality of teaching and to raise teachers’ subject knowledge and understanding. Where such teachers have been found, they have a perceptible positive influence on standards”* (ibid).

Schools need support provided to break ‘the cycle’ and develop design and technology for their pupils.

Despite the growing demand for CPD identified above, it was clear from the interviews carried out as part of this study that the level of support available through CPD has declined over the last few years. This may be largely due to the scaling down of the advisory service for areas of the curriculum such as design and technology in many local education authorities (IP62/1). However, the work of the Design and Technology Association (DATA); the National Association of Advisors and Inspectors of Design and Technology (NAAIDT); independent consultants and initiatives such as the DATA/TTA extended training courses go some way to provide much needed support for subject leaders. Professor Clare Benson, who is responsible for setting these courses up, reported that evaluations for the ten-day course are always positive and the teachers say that the course has had an impact on their work; they feel much more confident.

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

### The Questionnaire

The following analysis is compiled from data from the written responses of the subject leaders collected during network meetings. The questions were progressive in their contextual relevance and addressed the following issues.

### Timetabling

The first question asked of the subject leaders was about the amount of time given to design and technology in their schools (see Figure 2 below: Organisation of Design and Technology Teaching Time). On analysis of the data, weekly taught lessons were by far the most common strategy used to teach D&T with 55% using this method. 4% of the subject leaders reported that their schools blocked either 2-3 days up to a week, with 7% of schools using design and technology weeks. Of the rest of the schools, 31% were using a combination of blocked and weekly teaching time.

In these schools, the designing was carried out in the weekly sessions leading up to a whole day per term for 'final project' (SL281/6). Subject leaders raised the issue of support during blocked days reporting that a number of parents and support staff were involved (SL133/13).

The response of one subject leader demonstrated the different approaches adopted by each age phase/Key Stage:

*"In Key Stage 1, the teachers tend to block the work over about a week to make the subject more meaningful for the younger children" (SL281/1).*

Other subject leaders reported on different patterns adopted through the school with some leaving the timetabling for design and technology of teaching to groups within the school:

*"half-termly alternated with Art for Key Stage 1 and 2. Reception and Nursery all the time as part of knowledge and understanding of world creative and physical skills"(SL281/25).*

*"left to year groups to decide. Either: one hour per week / two hours every fortnight / often a day / two day block each term" (SL281/15).*

It is interesting to note that very few teachers specifically mentioned teaching D&T with other subjects although those that did reported very positively:

*"Topics are set each term throughout year groups, for example homes, pets, and toys. D&T tasks are linked to these and focused on when appropriate, for example Year 1 small groups / Year 2 blocked into D&T day, for example design and make a car"(SL63/6).*

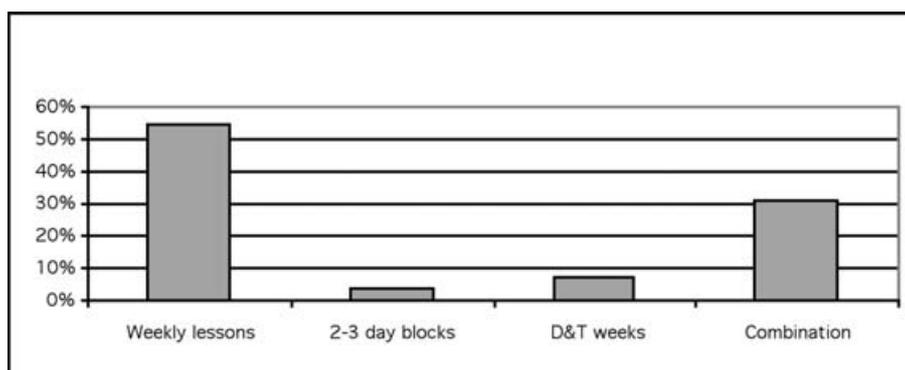


Figure 2: Organisation of Design and Technology Teaching Time

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

Other subject leaders reported that at their schools they built their D&T teaching into topics, with one reporting that colleagues often *“try to make it coincide with another topic i.e. QCA playgrounds (D&T) with forces in Science” (SL281/1)*, while another reported that they linked the QCA units to QCA units in other subjects to *“form loose topics” (SL281/25)*.

### Schemes of Work

The second question asked of the subject leaders was intended to further set the context for exploring support for design and technology in their schools.

Unsurprisingly the QCA Units of Work for Design and Technology and the Early Learning Goals were used by 84% of the schools whereas 5% used their own Scheme of Work and 5% used a combination of the two (see Figure 3 below: Schemes of Work used by Coordinators).

When the subject leaders were asked about the units from the QCA Schemes of Work (see Figure 4 below: Popularity of the QCA units for Design and Technology) it was clear that all the units except 6D

were being used, some obviously more popular than others with certain units significantly more popular than others. In some of the responses it was not possible to extract sufficient detail to include in the data so the following chart represents responses to this issue from 65% of the subject leaders.

Food units seem to be very popular, with several subject leaders reporting their positive impact on the teachers and children. Control, either mechanical or control, seem to be less popular, one subject leader identifying lack of experience as being the reason. Although one subject leader responded positively about the Fairground unit, the amount of organisation required was commented on. Textile units were seen as not being unpopular but time demanding and often have to be taught in small groups, especially working with Key Stage 1. One CPD provider interviewed reported that Unit 6D Controllable Vehicles *“is the most commonly requested unit of work by some margin, then units on levers and linkages, electrical control, links to ICT – particularly computer control” (IP33/1)*.

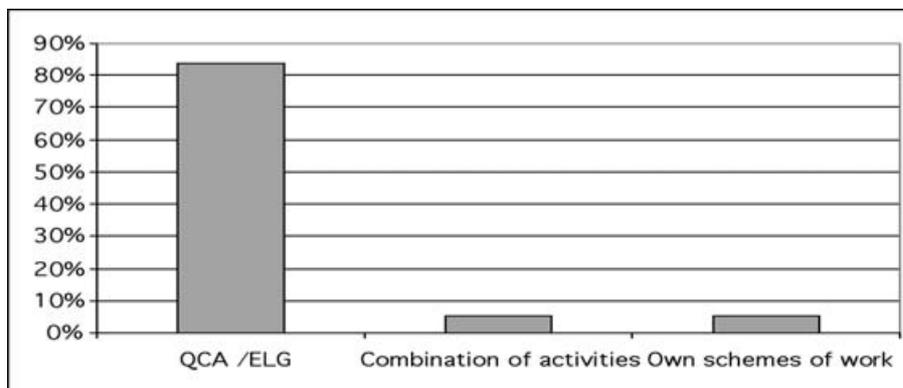


Figure 3: Schemes of Work used by Coordinators

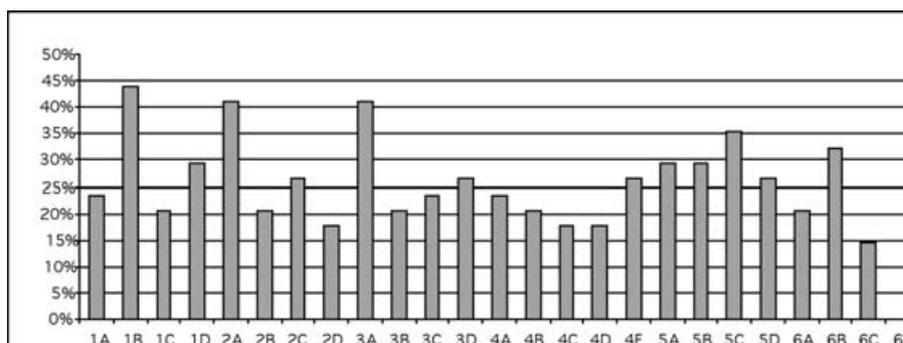


Figure 4: Popularity of the QCA units for Design and Technology

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

### Influences on the Teaching of Design and Technology

Having established the context of the design and technology education in the schools represented the questionnaire moved onto what, in their opinion and experience, the subject leaders felt had had the biggest impact on the subject. The subject leaders were divided in terms of how they interpreted this question with 45% framing their answers as constraints in teaching design and technology and 49% reporting on positive impacts (see Figure 5 below: Impact on Design and Technology in Schools).

16% of the subject leaders felt that the QCA Scheme of Work for Design and Technology had had the biggest impact on the teaching of the subject in their schools. Teacher enthusiasm and the children's interest were felt to have the biggest impact in 24% of the schools. The more negative impacts included the implementation of the National Literacy and National Numeracy Strategies (11%), resources (16%) and the effect of SATs on Year 6 design and technology work (2%). "No foundation subjects are taught from February half term onwards" (SL281/7). The introduction of other subjects was seen by 7% of the subject leaders as having the biggest impact with again, "all foundation subjects under pressure" (SL281/17). One of the subject leaders

identified CPD in design and technology and further study they had undertaken as having supported the development of the subject throughout the school (SL133/6).

A similar response was evident in one of the interviews with subject specialists where the biggest single impact on the teaching of design and technology in the school was seen as a new coordinator with enthusiasm (SSL122/1). A change of Headteacher was pivotal in one school where the incoming Headteacher was very keen on design and technology (SL133/8). Support by Headteachers is essential and the experience of one CPD provider led them to believe that even if the Headteachers haven't attached a high priority to the subject "they can see the benefit to the coordinator attending the course and for the children in terms of breadth and balance" (IP33/1).

During one of the interviews carried out with a teacher who was not a specialist in design and technology, it became obvious that the Literacy and Numeracy Strategies were seen as having the biggest impact on D&T, although the teacher had experience of teaching in another school which had focused weeks to "push on subjects" such as D&T. The teacher also stressed that D&T is not neglected any more than other foundation subject. (NST53/1)

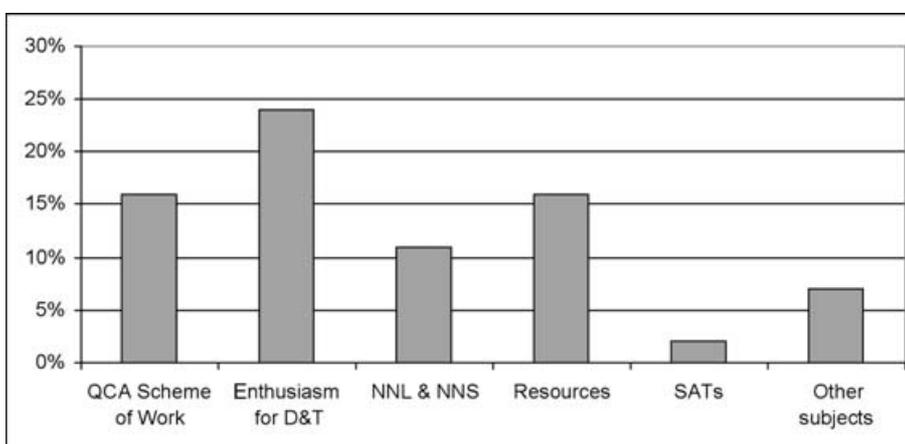


Figure 5: Impact on Design and Technology in Schools

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

Another non-specialist teacher felt that the QCA Schemes of Work have had the biggest impact on the teaching of D&T (NST262/1). This is supported by an interview with a graduate design and technology specialist who is currently the subject leader. This teacher also feels that the QCA units have really supported teachers and that staff are happy to do a similar project and adapt it. *"The children's work always looks very different – children make choices and if the design doesn't match the outcome the children are able to say why they have changed their design"*. However, this subject leader stressed that the biggest single impact on the teaching of design and technology in her school was the introduction of process sheets which have focused teachers (through the process) (SSL242/1).

### Support

The main concern of this study is the support that is available to NQTs in teaching design and technology. As the subject leaders would be the obvious 'experienced teachers of the subject' to support the next question focused on the support available to the subject leaders. As indicated by interviews with CPD providers, external support varied from area to area. The subject leaders were asked to identify strategies that could be used to give support for the subject (see Figure 6 below: Support for D&T Teaching). Although school based CPD was seen as the most important support

system, with 33% of the subject leaders describing this in varying forms, specialist support from advisors or other subject specialists was felt to be essential by 29%. Resources such as the Internet were seen by 9% of the subject leaders as being a source of support, while twice as many saw DATA as providing the support in the form of publications such as the Help Sheets for the QCA Scheme of Work and the Lessons Plans. 18% suggested using support networks such as clusters of schools while 9% saw secondary schools as potential sources for support.

A non-specialist teacher suggested getting someone from outside school, demonstration lessons; team teaching with the coordinator; linking the learning objectives and having the links made (NST53/01). Workshops and 'hands on' experiences were also seen as strategies for support in the absence of outside support, concerns about technical aspects and things to make with the children (NST262/01).

One of the CPD providers interviewed identified the importance of having a 'named' person to turn to for support. Support is also being given in the authority through network groups which aim to be self-sustaining (IP62/1).

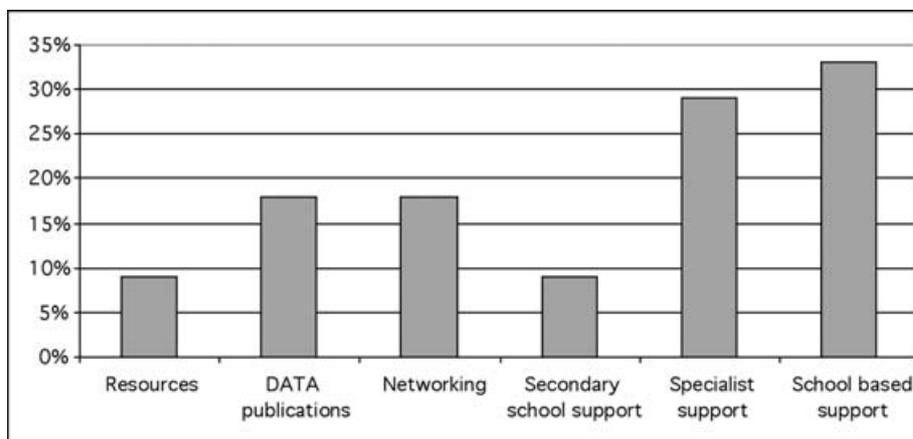


Figure 6: Support for D&T Teaching

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

### Preparation for Teaching Design and Technology in NQT Year

The final question related directly to the concern which had driven this study. Given that the support for schools varied so much and had to be gleaned from numerous sources due to the limited support that was available through the local advisory services what did the subject leaders see as adequate preparation for teaching design and technology in the first year of teaching. From analysis of the responses 'hands on' experience of the materials, (see Figure 7: Preparation for Teaching Design and Technology) processes and QCA Schemes of Work for Design and Technology were felt to be essential by 56% of the subject leaders. One of the subject leaders wrote "They must experience D&T at first hand and go through the process themselves – this takes time" (SL281/25).

55% of the subject leaders mentioned the process with comments such as "You need to know the whole process, then basic skills for each topic" (SL63/2).

Others highlighted the importance of experiencing a D&T topic from start to finish with "looking at how things are made, focused practical tasks etc." (SL63/6).

Having a theoretical framework was also seen by 53% as a priority while 24% suggested that teaching design and technology on their blocks of school experience was essential "having the experience of practical work with children" (SL133/3).

7% of the subject leaders mentioned confidence but this is linked with the practical experience "Being able to try it out gives the confidence to teach it" (SL281/3). This was supported by interview data: "Minimum experience required of NQT are practical, hands on experience, ideally with children on TP; experience of handling tools and materials; planning a series of lessons; experience of linking D&T with other subjects; the knowledge of how to teach D&T that is meaningful to children" (SL262/1).

When discussing the role of school experience in preparation for teaching design and technology one non-specialist teacher raised the issue of teachers' confidence when student teachers observe them teaching design and technology. Often it is going on in other classrooms but the teachers concerned are unwilling to be watched. The teacher suggested that if the requirement was changed to team-teaching rather than observing and to supporting the teacher they may be more willing (SL 53/1).

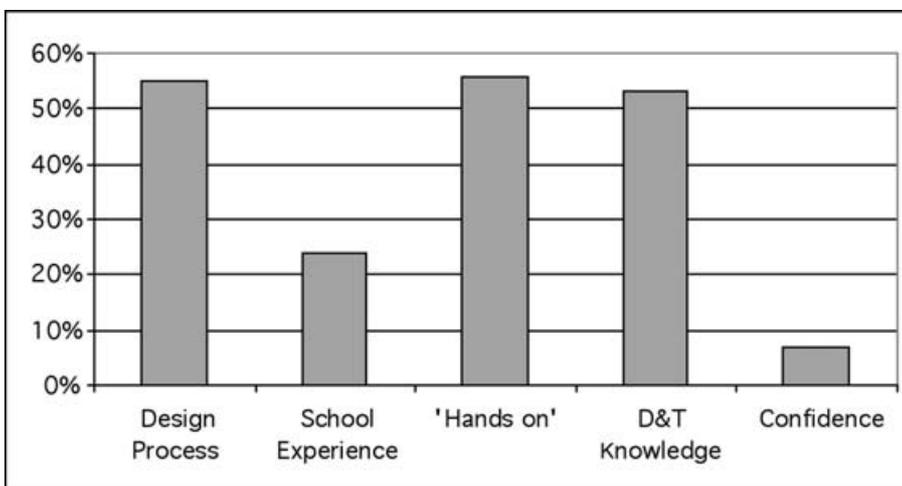


Figure 7: Preparation for Teaching Design and Technology

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

### Overall Findings

The aim of this study was to gain insights into the issues surrounding, not only the revised TTA Standards for ITT, but also the context and support for design and technology teaching at a local level. What has emerged, within the constraints of a study of this size, is the overwhelming desire by subject leaders, classroom teachers, ITT and CPD providers to offer children the best experience of the subject area they are able to do. In this respect the outcomes are very positive and the willingness to give of time to answer questionnaires and grant interviews to look at the issues has been invaluable and much appreciated. Some of the findings have been surprising, for example, the way in which the more open-ended question about what had had the biggest single impact was viewed as a positive by some and a constraint by others.

The suggestion that teachers should have the opportunity to see examples of good practice was put forward by several of the teachers and providers interviewed. This is addressed in part by DATA in the Leading Teachers Award and, from one of the interviews for this study, it was apparent how important this role is in offering this opportunity. At present there are fifteen Leading Teachers. The development of a National Design and Technology Centre at Ironbridge is one of the recent initiatives in helping to raise the profile of the subject. The role of manufacturers and suppliers cannot be underestimated in the support that is available in terms of resources.

There are references to support for the foundation subjects in *Excellence and Enjoyment: a strategy for primary schools* under 'Continuous professional development opportunities': "and will also offer opportunities for teachers to develop their expertise in other subjects". On the same page, under the heading 'Support from consultants' there is a commitment to "offer support for the foundation subjects, so as to offer active help in designing a broad, rich and engaging experience for children" (DfES 2003 p30).

We can only hope that the levels of support provided by the Literacy and Numeracy Strategies will be extended to all the foundation subjects as outlined in the Executive summary. As mentioned at the beginning of this article, it is a pity that there is not one specific mention of design and technology (along with some other foundation subjects).

In the meantime, strategies suggested by the study data to support the teaching of design and technology are a positive way forward. Team teaching will help to build confidence, particularly with NQTs who have not had much opportunity to observe or teach design and technology during their school placements. Using the QCA Scheme of Work gives teachers a structure for their planning. The units should, however, be used as a starting point, to illustrate the kinds of activities that can be carried out to provide breadth and balance. School based CPD activities such as staff meetings or days, where there is the opportunity for 'hands on' alongside support from advisors was widely felt to be important. The changes in priority for local authority advisory services schools can feel still feel isolated with no central figure to offer support when needed.

### What does this all mean?

It is clear, from analysing the data, that a much larger study is necessary to challenge decisions that are made which may be strategic but would result in an impoverish learning experience for children in Foundation and Primary phases of education. Because of lack of confidence and/or 'hands on' experience of designing and making teachers might settle for 'safe' and perhaps more prescriptive activities. This is illustrated in some way when schools 'buy in' expertise to deliver D&T but there is no follow up after the session and, while the children have an excellent time making, little designing may be carried out. The 'expert' has little control over this especially if the teachers feel that the requirements for design and technology have been addressed and can be 'ticked off' the long list of things to be covered in the year.

## Is it possible to ensure the survival of primary design and technology through ten hour courses?

Teachers need time to develop their knowledge and understanding of D&T. Despite the developing range of Internet sites offering support for design and technology, feedback from a leader teacher would suggest that time to explore these is in short supply (LT94/1). The support offered by DATA and QCA in resources, schemes of work, lesson plans, manuals for school based in-service is invaluable but cannot replace personal 'hands on' knowledge and understanding afforded by courses during ITT programmes.

In answer to the question posed by this article it is impossible to know what will happen to the design and technology in the primary curriculum. As more and more institutions move towards non-QTS courses followed by a Post-Graduate Certificate year the situation in ITT may become more difficult than it is at present. Whatever happens in ITT it is clear that there needs to be more support for subject leaders to enable them to take on the added responsibility of training NQTs to teach design and technology.

*m.rogers@gold.ac.uk*

### References

Davies , D, Egan, B, Martin, M, Rogers, M, (2000), 'Carrying the Torch – can student teachers contribute to the survival of design and technology in the primary curriculum?', *The DATA Millennium Conference Proceedings*, The Design and Technology Association, Wellesbourne

DfES (2003), *Excellence and Enjoyment: a strategy for primary schools*, DfES Publications

Ofsted (2002), *Design and Technology in Primary Schools*, Ofsted Subject Reports Series 2001/02, Office for Standards in Education