Carrying the torch - can student teachers contribute to the survival of design and technology in the primary curriculum?

Carrying the Torch – Can Student Teachers Contribute to the Survival of Design and Technology in the Primary Curriculum?

Daniel Davies, Bath Spa University College; Maggie Rogers, Goldsmiths, University of London; Bridget Egan, King Alfred's College, Winchester and Mike Martin, University of Central England.

Abstract

Not since the statutory introduction of design and technology as a foundation subject at Key Stages 1 and 2 in the National Curriculum for England and Wales in 1990 has there been more pressure on its survival in primary schools than at present. The 'deregulation' of the non-core curriculum to make way for the introduction of National Literacy and Numeracy Strategies has, according to Rogers and Davies (1999), had a devastating effect upon the classroom time it is currently allotted in many schools. The situation is, if anything, more acute in primary initial teacher training (ITT), where the impact of a series of government circulars, culminating in Department for Education and Employment (DfEE) Circular 4/98, has reduced total course provision in design and technology for the majority of students to a few hours.

Although some hope may be on the horizon – in the shape of the new rationale for the subject in the Secretary of State's proposals for Curriculum 2000, and the positive exemplification provided by the national Scheme of Work (QCA/DATA, 1999) – the situation is currently very difficult for primary student teachers required to teach design and technology during their school experience. Unless these opportunities are made available, a generation of primary student teachers may emerge from training with little or no experience of classroom or college design and technology, thus risking undoing much of the good work in teacher development undertaken during the last decade. It may then be too late to undo the damage done to the concept of a 'balanced curriculum' in which design and technology has a significant part to play.

Keywords

primary, initial teacher training, student teachers, planning

Introduction

In response to the erosion of foundation subjects in school and initial teacher training curricula for England (QCA, 1998; DfEE Circular 4/98), the report from the National Advisory Committee for Creativity and Cultural Education (NACCCE, 1999) has stressed the importance of "a broad, flexible and motivating education" and stated that, in preparing for the twenty-first century, "we will have to do more than just improve literacy and numeracy skills". The "supply and training of teachers and the extent to which current training takes account of the importance of creative and cultural education" was the main focus of the report, which also highlighted the choices currently being made in ITE institutions between foundation subjects as "unhelpful". The development of partnerships between schools and initial teacher training programmes to promote these missing portions of the primary curriculum was strongly supported, whilst acknowledging the "serious difficulties for the promotion of creative and cultural education of student teachers, and by implication, of the children they eventually teach" (NACCCE, 1999).

Experiences of running specialist and non-specialist courses in design and technology during which student teachers report back the difficulties they have in 'fitting' their activities into an overcrowded timetable has led the authors to initiate the project reported here. Informal discussion with students has revealed that a significant problem is the mismatch between rigid school placement positions and the increasing tendency on the part of schools to 'block' foundation subjects into certain parts of the year. Creating 'space' for design and technology where none currently exists has therefore become a central concern for students seeking to teach the subject during block placements.

The research project

Work is currently underway in four institutions of primary ITT to examine ways in which student teachers can make the most of the opportunities they have to teach design and technology in the classroom. The colleges are located in contrasting areas: two in large conurbations (London and Birmingham) and two in small cities in southern England (Winchester and Bath). Student teachers in their final or penultimate year of a three- or four-year undergraduate training course form the sample, since this is where the majority of primary design and technology is taught in the participating institutions.

The project follows a pilot study undertaken with a sample of 41 second-year students taking a level 2 design and technology option at Goldsmiths College, University of London, during 1998-9. The methodology and findings from this pilot year – described below – set the agenda for the wider sample. We were particularly anxious to provide some validation for the tentative typography of student responses to the school situation developed through analysis of assignments submitted after the placements.

Methodology – pilot sample

During the taught component of the course the student teachers were asked to outline their plans for teaching design and technology on a forthcoming school placement. The data collected at this point indicated those who were able to chose their own activity and those whose choices were restricted by their school context. From this data and verbal feedback elicited on completion of the practice, it was possible to ascertain the extent to which these plans had been realised a) in their entirety, b) with minor modifications, c) completely changed, or d) not realised at all.

A more detailed analysis was carried out on submission of the design and technology second-year assignments. The assignment brief required the students to outline activities which they could carry out with their chosen age range, identifying the issues in implementation in the classroom. They were further asked to demonstrate how they had addressed these issues during their teaching experience placement through the submission of a reflective diary with a critical commentary. A qualitative analysis of the assignments submitted revealed several significant factors in the experience of the students, from which the authors have created a general picture of concerns.

Case studies were identified as characterising the key issues and the students' responses to them.

Findings – pilot sample
One of the most significant constraints that student teachers encountered was time allocation for design and technology. The majority (28, or 68%) had three or fewer sessions (lessons or equivalent) available throughout the five-week placement, with some reporting that they had worked with small groups in order to 'fit in' a subject that would otherwise have been absent from the timetable. For example, the ‘blocking’ of design and technology time into concentrated periods during the year meant for one student that her class had already completed their assigned unit of work during the previous term. The choice of design and technology topic/activity was also a constraint for 13 students (31%), although several reported that some negotiation had taken place to enable them to fulfil the assignment.

In order to overcome the constraints outlined above, students devised solutions which were subsequently categorised into the following illustrated groups.

1. *The creative use of time and curricular relationships*. In one school, the student teacher’s class had already studied their curriculum quota of design and technology in the previous term. However, as the children were studying food and nutrition in science, the student was able to plan for one lesson in which the children could design and make a healthy sandwich. Another student was encouraged to split the sessions allocated for teaching geography to enable a group to work on a project to design and make fans. As the class had finished working on electrical circuits the previous term, with a particular focus on how electricity 'flows' through a simple electrical circuit, the student made use of these links whilst retaining a clear distinction between the science and technology components. In all, 22 of the students (54%) linked their design and technology work to other curriculum areas. Links were made predominantly with science (10), English (6) and history (4), with two students using RE as their focus. Only one of the design and technology specialists adopted a cross-curricular approach. Thirteen of the students (32%) planned and carried out discrete design and technology activities (the majority of these were design and technology specialists).

2. *The creative use of Literacy Hour* (the Numeracy Hour was not yet statutory at this point). In one school preparing for a production, the student teacher used the opportunity afforded by looking at information texts during the Literacy Hour to develop sets of instructions for making masks. Another student held over an evaluation of completed outcomes (bags) until a Literacy Hour later in the week, in order to develop writing within a specific genre.

3. *The creative use of children's prior experience*. In one nursery school, the student became aware of the wide range of children’s background experience of joining materials. She developed open-ended activities centred around the development of props for stories, to which the children could bring their own experiences and knowledge. Across the sample children's prior

experience of design and technology varied widely, but was a significant factor in some instances where students were able to build on previous work despite the restrictions on time.

4. *The creative use of resources*. One student teacher negotiated the planning for a project on Greek masks so that she could mirror the experiences of the parallel classes, but by enlisting the support of parents she was able to give the children the opportunity to use a much wider range of materials and processes, including Formafoam and papier mâché.

In general, the data elicited from the pilot sample indicated that student teachers were going to some lengths to develop innovative solutions to the timetabling problems facing design and technology in 1998-9. We resolved to find out whether the issues faced and types of approaches developed were similar across a wider sample of students, drawn from different institutions in different settings. The purpose of this second phase of the project was also to determine whether *suggesting strategies* akin to those developed at Goldsmiths would assist student teachers in other institutions to maximise the 'design and technology potential' of their school placements.

Second phase of research – the wider sample
The sample used for the wider project in 1999-2000 has the following characteristics:

Table 1: Characteristics of the sample for the second phase of the project.

((table 1 to go here))

The data was collected at the end of students' school placements using a standard proforma. The sections of this are indicated in the tables of results below.

Findings – wider sample

Table 2: Characteristics of the schools in which student teachers were placed.

((table 2 to go here))

A greater predominance of small schools were used by institutions 1 and 4, at opposite ends of the urban-rural continuum. The inner London primary schools in which Goldsmiths' students worked tended to be viewed as less well resourced for design and technology than those for the other institutions. Generally the level of resourcing appears to be reasonable, as should be expected after ten years of statutory design and technology, though very few students reported high levels.

Table 3: Opportunities for teaching design and technology on school placements.

((table 3 to go here))

The above results are surprisingly encouraging, and appear to portray a more positive scenario for design and technology than those obtained in the previous year, though this may be because strategies for 'fitting design and technology in' were suggested to groups 1 and 4 prior to the placement. Across both key stages a good range of design and technology projects was able to be taught; note the high proportion of 'structures' projects in the light of the decision to remove structures from Curriculum 2000. Significant proportions of the specialist students (those in institutions 1 and 3) were able to devote five sessions/hours or more across a block practice of eight weeks. The design and technology specialists also appear to have had more say in what they taught, and to be less constrained by school schemes of work than the other groups.

Table 4: Approaches adopted to the teaching of design and technology.

((table 4 to go here))

The finding that the majority of students chose (or were directed) to teach design and technology through cross-curricular contexts, despite the

increasingly rigid subject boundaries in the primary curriculum as a whole, demonstrates the necessity of re-establishing meaningful links in order to achieve significant learning outcomes. Strong links with art, and their own specialist subjects, feature prominently in the work of students at institutions 2, 3 and 4, whereas Goldsmiths' students (some of whom formed part of the sample for the pilot year) tended to make links with science and English, particularly in the context of Literacy Hour. Students from institutions 1 and 4, in which the pre-defined strategies were discussed prior to the placement, were more likely to adopt one of them, whereas there was only limited take-up in other institutions.

In developing additional strategies, several students mentioned the use of a 'carousel' of design and technology activities, that groups of children could move between to maximise coverage of the Programme of Study in limited time. Another popular strategy was to split the class into two and then combine curriculum time slots for two subjects, so that children had one long session in two weeks rather than two short ones. Blocking whole days, or even in one case a whole 'Millennium Week', of creative activities enabled far more ambitious design and technology projects to take place than would have otherwise been the case. A broad range of benefits were identified for the strategies used, and the majority indicated that they would use them again.

Conclusion and implications

Preliminary results from the second phase of the project indicate that the general situation for students seeking to teach design and technology on school placements may not be as bleak as we feared. In particular, design and technology specialists appear to have reasonable autonomy in deciding what and how much to teach. Nevertheless, there continues to be a need for students to work creatively in the school context to maximise the validity of their design and technology experience, and this project shows the wide variety of ways in which they seek to achieve this. All students have shown a commitment and enthusiasm for the subject which has resulted in real attainment, motivation and enjoyment on the part of children. In many cases these children's own class teachers may not have had the opportunities to provide them with such a rich experience. Whilst institutions of ITE continue to 'keep the flame alive' with their students, disseminating examples of good practice and pragmatic implementation, it would appear that to announce the 'death of primary design and technology' may be somewhat premature!

References

Department for Education and Employment (1998) *Circular 4/98: Requirements for Courses of Initial Teacher Training*, London: DfEE

National Advisory Committee on Creative and Cultural Education (1999) *All Our Futures: Creativity, Culture and Education*, London: DfEE

Qualifications and Curriculum Authority (1998) *Maintaining Breadth and Balance*, London: QCA

Qualifications and Curriculum Authority/Department for Education and Employment (1999) *The Review of the National Curriculum in England – The Secretary of State's Proposals*, London: QCA

Qualifications and Curriculum Authority/Design and Technology Association (1999) *Design and Technology – A Scheme of Work for Key Stages 1 and* 2, London: QCA
Rogers, M. and Davies, D. (1999) 'What Has Happened to Primary Design and Technology? – Student Teachers in Search of a Foundation Subject', unpublished conference paper presented at *BERA 99,* University of Sussex at Brighton (2-5 September)