Stimulating Pupils' Design Thinking in CDT

Peter Sellwood

Ever since Plato divided the population into 'thinkers' and 'doers', and then favoured the thinkers, the doers have come off badly in terms of status within the educational world. The scholar has always been portrayed as the 'head in the clouds' intellectual, living a cloistered life and studying in a monastic way. Academics are seen as those who have a profound knowledge of a specific subject, gained by extensive reading and study.

For some unfortunate reason the doer seems excluded from the higher order of human endeavour. Yet surely, Leonardo Da Vinci, Brunel, Edison and the Wright Brothers were all 'thinkers and doers'; they were of course, also designers, craftsmen and technologists — is not this the model we should set for ourselves?

In the late 1960's and early 1970's during comprehensive re-organisation, developments in 'Design Education' provided the opportunity for integrated design activities and, via block-timetabling, the time to 'think' and 'design' as well as 'make' throughout all of the practical subjects. The success of Design Faculties depended largely on the leadership qualities of the Head of Faculty and the knowledge and enthusiasm of the staff. Design philosophy varied greatly from school to school and little was done at initial training level to prepare for integrated studies and design awareness. It is not surprising that it was a long time before this type of faculty began to bear fruit. The tragedy was that a subject-based examination system and some teachers' attitudes resulted in its dissection into separate subjects, roundabout, or circus systems and the loss of an opportunity.

Recently, there has been a major initiative in introducing technology into the practical curriculum; this development happily accommodates both 'thinkers' and 'doers' and has given much needed respectability to practical learning. Design is beginning to flourish alongside this initiative. Technology associated with design is seen in good departments as totally cross-curricular.

The view of design/technology, where it is seen as the use of knowledge in practical problem-solving activities, contrasts with the idea that equates technology with craft-work. Craft-work is concerned with the production of solutions to previously solved problems and, as such, it can be a therapeutic activity which may develop valuable practical skills. Sometimes considerable emphasis is placed on the development of these skills to the extent that the original problem that generated the need for them is forgotten until a new technology solves the problem more effectively and makes redundant those skills that have been developed.

During the past five or six years, the importance of practical learning has been realised at primary school level. Initiatives such as the Educational Support Grant Scheme for Science and Technology has shown the potential of children's inventiveness and design abilities in 'Design and Make' activities. Studies in structures, mechanisms and energy has resulted in children inventing and constructing both static and working models, and in doing so has helped them to come to understand a complex and highly technical world. Through this work, they have developed an awareness of the potential of materials, how things work and movements associated with both the natural and the man-made world.

Children are fired with enthusiasm when presented with these opportunities, yet it is an unfortunate fact that, all too often when the child reaches secondary school, it is offered boring and prescriptive craft work. When it is made relevant to the educational needs of pupils, CDT is a very potent learning medium. The Engineering Council's Publication 'Problem Solving: Science and Technology in Primary Schools' (1985), and the Design Council's report 'Design in Primary Education' (1987), have emphasised the importance of practical activity within the learning process. The Design Council document is definite in its view, saying that 'The making and doing element implicit in many design-related activities does not simply encourage children to think. Thinking and learning actually arise through doing'. It values these skills as every bit as 'basic as literacy or numeracy', and the Cockcroft Committee are equally supportive in their report 'Mathematics Counts' (1986), when it states 'For most children, practical work provides the most effective means by which understanding mathematics can develop'.

Examination restrictions have now been lifted with the introduction of GCSE, and mixed media activities developing the skills associated with Craft, Design and Technology are encouraged. It is now vitally important to challenge pupils in the early years of secondary schooling, allowing for the investigative and problem-solving skills that have been developed at primary level to be built upon. They are capable of inventing and designing, and provision should be made for this to happen. Technology moves on at a relentless pace; today's inventions and discoveries quickly become tomorrow's museum pieces. Therefore, it is senseless to teach skills and techniques in a prescriptive way; they will become redundant before the student has cause to employ them. We must give students the structure, opportunity and encouragement to learn how to learn for themselves. This, in my opinion, can only be done by adopting a practical problem-solving approach to teaching Design, Craft and Technology.