

David Hargreaves has recently been appointed as head of the Qualifications and Curriculum Authority, the body responsible for the National Curriculum and its related assessments. His appointment is significant at several levels and, for those of us in design and technology it is particularly so. In a former role, Hargreaves was responsible for the Inner London Education Authority, and he experienced there the powerful impact on schools of the pioneering activities of emergent design and technology departments.

At the end of November 2000, Hargreaves spoke at the Institute of Education in London on the subject of education for innovation, and it was clear that his subsequent experiences of design and technology have done nothing to dim his enthusiasm for it. He spoke of it as '... moving to the heart of the curriculum,' and as having features that '...other subjects can learn from'. In fact, in a one-hour presentation to academics, policy and management specialists, Hargreaves devoted 10 minutes to singing the praises of design and technology. So why might this be?

I think there are two strands of thought that attract Hargreaves to what he sees in the best practice of design and technology. The first concerns pedagogy; the models of teaching and learning that have grown to become customary good practice in our studios and workshops. The second (related) strand concerns our approach to knowledge in design and technology.

In design and technology, Hargreaves notes that work is *task* centred and typically takes the form of projects in which students pursue individual (or team) solutions to task that are sometimes more and sometimes less open ended. The teacher's role is multifaceted; part guide, part instructor, part co-explorer, part prompt, part challenger or provocateur, to mention but a few. Striking an effective balance between these multiple roles is the artistry of the good design and technology teacher. Of course, all subjects will sometimes use project methodologies that require this artistry, but in design and technology it is our stock-in-trade; our everyday practice. For too many subjects (not least science) the mountains of content that teachers have to 'cover' seem largely to preclude such active approaches to learning. I hesitate to paraphrase Hargreaves' lecture, but I suspect that he would place such good teaching and learning processes above considerations of content. His concern appeared to be more with how we teach than with what we teach. I think his priority would be to establish a rich and effective pedagogy that can draw upon

disciplinary knowledge as necessary to the task in hand.

This argument leads Hargreaves to an apparently paradoxical position. His concern is with fitting youngsters to cope with what has been described as the new knowledge economy in which the boundaries of knowledge – and even what counts as knowledge – are constantly shifting. The disciplinary certainties that enabled 19th century educators to create the framework of our present curriculum are breaking down, particularly so when the education world meets the world of employment. Very few employers now require single subject specialists. They require employees capable of displaying the flexible key skills that QCA is seeking to weave through the subject-based structure of the curriculum. The paradox I mentioned above is therefore perhaps better described as a misnomer. The label 'knowledge economy' is misleading since, as Hargreaves pointed out, to cope in a creative knowledge economy youngsters do not need to be loaded with more and more knowledge. Rather they need to be empowered with the skills of acquiring and creating the knowledge they need to pursue the task in hand.

Again I do not seek to put words in Hargreaves' mouth, but the message I took from his lecture was that propositional knowledge of the 'know that' kind, has traditionally (in our formal curriculum) been elevated beyond its real value. Hargreaves appeared to me to be promoting the view that in a world in which knowledge is exploding exponentially, we should rather be placing emphasis on the skill of acquiring task-related knowledge and supporting students in the creation of new, task-related knowledge. And once again in design and technology I suspect that Hargreaves sees a subject in which this view of knowledge has been established for at least 20 years.

In the late 1970s, the emergent A' Level syllabuses in design and technology boldly and explicitly made the point and refused to pack the syllabuses with fixed bodies of knowledge. They then ran foul of the university admissions system which was unused to such a flexible and active approach to knowledge and refused to acknowledge design and technology as an appropriate university entrance qualification. In the end, to illuminate the issue, a study was undertaken by the Council for National Academic Awards (CNAA) in association with the Standing Conference on University Entrance (SCUE). In a landmark report, they commented as follows:

'When embarking upon a new design, the package of knowledge and skills necessary

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References

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for the success of the venture will emerge as the design progresses, and so the need to acquire knowledge and skills (and sometimes extend the boundary of knowledge and devise new skills) becomes a clear requirement for the designer.' (CNAA/SCUE, 1980)

Subsequently, in 1981, the Department of Education and Science produced its booklet *Understanding Design and Technology*, in which the very same view of knowledge was adopted.

'The designer does not need to know all about everything so much as to know what to find out, what form the knowledge should take, and what depth of knowledge is required for a particular purpose.' (DES, 1981)

In 1983, Hicks placed the argument in the context of encouraging children (and teachers) to cope with creative (uncertain and risky) environments.

'Teaching facts is one thing: teaching pupils in such a way that they can apply facts is another; but providing learning opportunities which encourage pupils to use information naturally when handling uncertainty, in a manner which results in capability, is a challenge of a different kind.' (Hicks, 1983)

The issue surfaced yet again in 1985, when the two examination traditions (GCE and CSE) were being merged into the new GCSE system. The Secondary Examinations Council (a former incarnation of QCA) produced subject-based booklets to support teachers in managing the transition, and in design and technology the point was re-emphasised that...

'It is just not possible to define exactly what one will be required to know about in advance of the activity...' (SEC, 1985)

In that critical five years from 1980-85 design and technology staked out its principles concerning the role of knowledge. And for the subsequent 15-20 years we have been developing approaches that enable our *teachers* to deal with the teaching challenge that Hicks outlined and to prepare our *students* to cope with the challenges of the knowledge economy that Hargreaves outlined in his lecture. Accordingly, in design and technology, we are somewhat ahead of the game when compared with our colleagues in disciplines that have been happy in the watertight purity of their subjects. I suspect it is this that Hargreaves is referring to when he describes

design and technology as having features that '...other subjects can learn from'. We are the specialists – the experts – in task centred learning. We have a long track record in helping students to 'use information naturally when handling uncertainty, in a manner which results in capability'.

A central part of the art of doing this is to recognise and value the role of tacit knowledge; the things that we have a hunch about but that have not been formalised or externalised into explicit knowledge. Designers thrive on tacit knowledge; and the world of materials, tools, studios and workshops is packed with opportunities to explore and exploit designerly hunches. This is not to celebrate amateurish tinkering, but is rather to make the case for the creative modelling that lies at the heart of design and technology. In the process of modelling and in the associated discussions with teachers and with fellow students, youngsters transform tacit into explicit knowledge and they frequently end up knowing far more about the topic of their project than do their teachers. The everyday experience of design and technology is of task-centred knowledge creation.

Times change! In the 1970s and 1980s our view of the role of knowledge in design and technology was perceived by many (not least the universities) as woolly minded weakness. The very same position is now recognised as placing us in the vanguard of those preparing youngsters for employment in the knowledge economy.