

Visions

In TERU at Goldsmiths we have recently completed a research project (on behalf of DATA) looking into the impact of the CAD/CAM in Schools Initiative with Pro/DESKTOP. In the 18 months since DATA launched the Initiative, thousands of teachers have received the software through accredited training for teaching CAD with their students and within a further 12 months, 95% of English secondary schools will be in a position to use Pro/DESKTOP, a sophisticated professional engineering design package. The changes that are being brought about in children's designing are sufficiently profound to deserve careful research and we were asked to undertake the study focusing on its application in Years 9 and 10.

Many interesting issues emerged within the study, but for the purposes of this editorial I would like to focus on one that arose in discussion with some of the teachers who were leading the Initiative in their schools. The issue is fundamental – and concerns what we see design and technology being like in a few years time. New technologies have always had the effect of throwing established practices up in the air, and the potential for a complete re-think of design and technology is not only possible – but is also now probably unavoidable.

Let me paint you a mental picture... starting out on a project, students log onto their screen and use digital scratch pads to knock around early ideas. The most promising possibilities are zapped into a CAD development package in which the form is developed and finalised, materials are specified and dimensions decided. The software knocks out the final drawings (which are only useful to the student – since the machine has all the data anyway), and transfers all the data to the (CAM) machining centre where – with a quiet hum – the prototype is manufactured with high precision. The first time the student touches the object is when it is presented to the client for user trials. No drawing skills (except those embedded in the software); no handling of materials (except to clamp blocks into the machine and remove the finished object); no experience of the 'feel' of making or the smell and texture of workshops? Can this be a proper vision?

Certainly the practice that we observed is not of this radical kind, but the teachers we spoke to were actively contemplating major upheavals in their departments over the next few years as the full implications (and opportunities) of CAD/CAM became evident.

One of the values of a radical vision is that it often has the effect of making us clarify – and justify – what we really believe constitutes a good design and technology experience. Andy Breckon, Chief Executive of DATA, has recently done exactly that in a keynote paper to the 3rd International Primary Design and Technology Conference (CRIPT at UCE Birmingham). He presented a radical new paradigm for design and technology, in which he argued that different aspects of design and technology need to be addressed at different levels.

The level one form of activity is when primary aged pupils are introduced to technological concepts. These would be concerned with *knowledge about design and technology*. This could be called design and technology knowledge because you cannot apply technological knowledge and concepts if you are not aware of them. Not knowing what you don't know is one of the basic problems for technologists. The second area I would be concerned about is application of knowledge in the made world and its influence on society. This could be called *design and technology issues*. Recognising the social and environmental impact of technological change is a crucial part of design and technology education and it must be emphasised in the curriculum. This category would involve pupils looking at how things work and analysing their functional, aesthetic and environmental impact. The third category relates to *design and technology innovation*. This category is about developing the skills for improving products and innovating to generate new ideas for the application of knowledge and skills. However, the pupil or a group of pupils should not always focus their work on the view that it must be made. This is why it has been separated out in design and technology, to allow for creative thinking and innovation without some major constraints, especially in the primary sector. It should mean that software simulation and novelty designs could have the chance to flourish, thus increasing creative thinking. The innovation may recognise a need but could be a set challenge. The final category that integrates the whole subject is *design and technology application*. This is concerned with designing and the creation of models, prototypes and the making of a product. (Breckon, 2001)

Breckon makes his case in part as a reaction to current practice, within which he believes there has been a tendency 'to limit the

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teaching of design and technology to areas of work in which a quality outcome can be physically generated'. He is attempting to find new models of practice that can free the subject for more innovative approaches.

Readers of the *Journal* will know that I absolutely agree with the general thrust of this ambition to innovate in the curriculum. After 11 years of the National Curriculum (albeit in three somewhat different forms [1990, 1995 and 2000]), it is probably timely that to revive the fundamental arguments about what is (and what is not) central to a good experience in design and technology. And we can be sure that this debate will be informed by the increasing availability of hardware and software.

I know that Andy Breckon would not expect me to agree entirely with his particular prescription for the future. I don't (for example) think that the implied separation of *knowledge* from action would be a good idea. The English curriculum is already too full of such separation (the pure versus the applied; the theoretical versus the actual), and these separations invariably have bad consequences for learners. The same argument (I think) might apply to the implied separation of *issues* from action. I would argue that one of the unique selling points for design and technology is that it requires (and thrives on) integration, whilst the rest of the curriculum appears to demand myopic disintegration. But my agreement or disagreement with the detail of Breckon's analysis is not the point here. The point is to *regenerate the debate* about our curriculum. What might be a good prescription for the next five years of development?

So what is your vision of how design and technology should be in five years time?

Never afraid to put his money where his mouth is, Breckon (I mean DATA) has invited us all to think about this matter and to submit our visions at the DATA conference next July. Specifically, DATA is inviting us (challenging us) to write a keynote paper for that conference outlining our personal vision of a new paradigm for design and technology. The best submission will result in the author presenting the keynote lecture at the conference AND receiving a nice financial reward. So get writing!

Postscript

It is not my normal practice to deal with more than one issue in the editorial, but events have somewhat forced my hand on this occasion. The recent White Paper on Education has set all sorts of hares running in all directions, and not least in the direction of specialist schools. There is much that might be argued on the topic of 'technology' schools or 'engineering' schools, but my immediate concern is with neither of these. I am struggling to make sense of the proposals concerning 'faith' schools.

A few years ago I was privileged to be examining students on their final teaching experience in Belfast. I observed students in a number of schools – including 'integrated' schools in which staff were quite deliberately seeking to bridge the community divisions in Northern Ireland. Teachers were helping young people to value cultural and religious difference and to deal openly and creatively with conflict. The belief amongst the staff I spoke to in those schools was that the painful divisions in Northern Ireland would have been greatly eased had ALL schools in the Province been integrated. It is very hard to educate for mutual understanding when youngsters are deliberately kept apart.

The idea that Ministers will now be welcoming an expansion of 'faith schools' is deeply irresponsible. It cannot do other than drive damaging wedges between sections of the community, storing up trouble for future generations. It makes life harder for all those committed teachers seeking to bring pragmatic tolerance to divided communities, and it signals the green light to those whose interests lie in the deeper, darker waters of segregation and intolerance. It is unbelievably daft.