As Others See It

Prof Richard Kimbell

Technology Education Research Unit, Goldsmiths University of London

It is well known that, over the last 10-20 years, design and technology has become an international fact of life. It is widely accepted that Britain evolved the concept as we currently understand it, but now we can observe design and technology-like practice in many corners of the world, particularly those that have an historical or cultural attachment to Britain.

Not surprisingly, each country puts its own spin on the underlying concepts and practices and this makes international comparisons very rich territory for those who are interested in continuously evolving our understanding of what design and technology is and what it might become. If we were all doing the same thing, we would not be able to learn from each other. As Darwin pointed out for us, diversity is essential if we are to continue to evolve and flourish. So the differences between the practices that we can find in classrooms in Canada, Botswana, Australia, Singapore, Finland (to name but a few) are really important in understanding the strengths and weaknesses of what we do in Britain. Indeed, the differences that exist within these nations are equally important to study: the differences between Scotland, Ireland, Wales and England are just as revealing as the differences between New South Wales, Western Australia, South Australia and the other states and territories of Australia.

Our National Curriculum has undoubtedly consolidated practice in ways that were unimaginable in the pre-National Curriculum era. In the 1970s and 1980s, when design and technology concepts and practices were under active development, there were very significant differences between what happened in Leicestershire (a centre of design) and what happened in Hertfordshire and Nottinghamshire (centres of technology). The LEA advisory teams, which played such a critical part in the evolution process, were not all singing from the same hymn-sheet. For that matter, the colleges of teacher education, which were equally important in the process, were also equally divergent in their traditions and approaches. Difference was important then and I would argue that (if we are concerned to continue developing) it is equally important now. To see serious difference, however, it is now more important than it once was to look beyond the shores of Britain to those overseas nations that have embraced design and technology and adapted it in their own distinctive and idiosyncratic ways.

In recent months I have been forced to examine carefully some of these differences. The National Academy of Engineering (NAE) in Washington USA has embarked on a project that is (in my experience) quite new and very bold. In the US they have defined what they mean by 'technology literacy' (their term for what we would describe as 'design and technology capability'). The NAE are now seeking to find out how the nation measures up to the definitions they have created. But interestingly – and uniquely I think – they are not seeking to measure the performance of the school population but rather of the general public. It is the NAE view – and it has much merit – that we should start with an understanding of what the nation understands and can do with technology and then we can evaluate how school programmes might address the deficit that they expect to identify.

So how should they start to go about this formidable task? Where do you get hold of the 'general public'? How do you make it worth their while to take part? What kinds of tests could be used? What kinds of technology should be included?

These and many other questions are in the process of being mulled over in Washington. I have suggested that it might be informative, and quite fun, to try some test activities in shopping malls or McDonalds. They would have to be immediately engaging, but at least the population being tested could be expected to be broadly representative of the public. By contrast, most of the public assessment projects that are written up in the literature are based on museum attendees, which seems to me not to be at all representative.

Another possible source has been pointed out to me through my connections in the legal world. I was recently sent the following summary of a quite extraordinary trial in Oklahoma that speaks volumes of the technological understanding and capability of at least 13 of the US general public:

> 'Mr X of Oklahoma City, Oklahoma, purchased a brand new 32-foot Winnebago motor home. On his first trip home, having driven onto the freeway, he set the cruise control at 70 mph and calmly left the driver's seat to go into the back and make himself a cup of coffee. Not surprisingly, the RV left the freeway, crashed and overturned. Mr X sued Winnebago for not advising him in the owner's manual that he couldn't actually do this. The jury awarded him $1,750,000 plus a new motor home. The company actually changed their manuals on the basis of this suit, just in case there were any other complete .... buying their recreation vehicles.'(with minor edits in the cause of decency and anonymity)

What on earth did Mr X think the 'cruise-control' was doing? And how did he think it did it? What mental model was he holding that suggested to him that flicking a switch on the steering wheel could engage enough technological systems to adjust the speed of the vehicle to the road conditions, to steer the vehicle around bends or obstructions and to bring it safely to a halt if necessary? The most telling feature of this case, however, is that it does not involve just Mr X. It also involves 12 good folk on the jury and presumably these folk were randomly selected from the population. This jury was so convinced of the justice of Mr X's case that they found in his favour with a handsome damages award. So these 12 folk must also have believed in the black arts of the cruise control button. Astonishing you might think, but what do you think the British public understands about automatic transmissions or central heating systems or burglar alarms or televisions or e-mail?

Anyhow, to get to the point of this editorial, back in Washington, the NAE Steering Group was sitting around a table evaluating possible test approaches and devices. It had been assumed, in the disciplined way that is characteristic of NAE procedures, that we should start by reviewing all the test approaches that were currently available in the US. Not surprisingly these ALL referred to testing student populations of one sort or another from pre-school through to postgraduate. Nevertheless, that is where we started and I have to report that it is a sorry story.

Testing in the US is absolutely dominated by the traditions of the multiple-choice test. Some supposed 'fact' is embroidered with (typically) four possible answers, of which one is 'right' and the others (by extension) 'wrong'. To be good at the test, you just need to identify enough of the 'right' answers. But try this for size...

An unsolved problem with nuclear plants is:
A. an accumulation of nuclear waste
B. the lack of safety for the workers
C. the shortage of trained personnel
D. shortage of money

or

Automobiles have enabled people to become more:
A. mobile
B. dependable
C. stationary
D. affluent.

If these were essay-style questions, I imagine that readers would have absolutely no difficulty in composing a compelling case for any of the options in both questions. Using the second question as an example, since my son can now drive, he can get to see his mates more (A), he can get to school reliably on time without the vagaries of the rural bus service (B), he is less fit than when he walked about more (C) and he has a wider circle within which to get jobs and can also raise cash with contributions made by others for lifts to the same school (D).

The point here is that getting the 'right' answer is about guessing the answer that is in the head of the question setter. The epistemology (what we mean by 'knowledge') is unacceptably crude and reductionist. Of course it is easy to understand why the USA has evolved this tradition of testing. The place is so huge and the numbers of people to be tested (even just in schools) is so vast that systems of testing have to be very lean and mean. But the backwash of this tradition onto the US perception of technological literacy is dangerously inhibiting. We work in a discipline in which process and practice are more central than propositional knowledge to our definition of what we are and what we do. Accordingly, the difference between doing it well and doing it badly is not to be found in knowing things.

It is true that, in Britain, we appear to be constantly struggling to find better ways to assess the performance of our students and we moan about this and that along the way. But despite all these arguments, there is virtually unanimous agreement that students' project work performance should be the basis for assessment. Long may it last and we should be grateful for the international diversity that enables us to see the value of this position.