

Why So Much Emphasis on Assessment?

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One of the realities of learning processes is that you only know that, or how well, you have learned something if there is some kind of feedback in the system. I know that I have learnt how to make my new washing machine work when I put in dirty clothes, and some time later take out clean ones. I also get a whole series of clues about my success along the way: I turn a dial and a light indicates that I have selected a particular wash programme; I re-set the dial and find that I can choose between more than one programme; a further light indicates which button has to be pressed to start the process – and when the button doesn't work another one indicates that I have yet to close the door. Then comes the reassuring sound of water flooding into the machine ...I have succeeded in getting the process off the ground. The feedback I am receiving is doing two things. It is reassuring me when I get things right and it is providing clues or prompts to help me learn. If I get really stuck, there is always the instruction book to refer to, which gives more detailed and authoritative advice, although often far more than I need at that particular moment.

So, with good feedback, a sprinkling of problem solving, a level of personal confidence and an authoritative source to turn to when needed, my learning in respect of using a washing machine makes good progress. What is notable though, is that before I engaged in this process, no one assessed me to see if I was capable of using a washing machine and the end no one assessed me to see what standard in using washing machines I had reached. And yet the learning took place.

So, why so much fuss about assessment!

Day-in, day-out, in classrooms, studios and workshops worldwide, supported by good systems of feedback, learning is similarly taking place. This is because the feedback and related support are implicitly or explicitly providing a framework for formative assessment. But not in all settings is learning being optimised in this way – often because good and effective use is not being made of assessment strategies. There is plenty of evidence to show that where assessment is

embedded appropriately in learning and teaching it is a thoroughly good thing. But assessment can also unhelpfully dominate, producing counter-productive results, and a total lack of assessment creates a system with no feedback and little hope of progress. Getting assessment right is not easy.

Assessment has increasingly been focused as new Design and/or Technology curricula have been introduced into a whole host of national and provincial settings. However, research to help get the best value out of assessment for learning and teaching is somewhat limited. For this reason, the Editorial Board of *Design and Technology: An International Journal* decided to provide an opportunity for consolidating some of what we know by focusing a special issue of the Journal on the subject. I am delighted to have had the privilege of acting as the edition's editor.

The aim of this issue is to gather a range of insights into assessing technological capability and/or literacy drawn from a variety of schooling contexts and diverse national settings. The explicitly cross-national emphasis means we are working with the reality of different educational cultures and therefore terminology, and so readers will find authors referring variously to, for example, Technology Education, Design and Technology Education, technological literacy, technological capability, design capability and even Sloyd, with papers being drawn from Australasia, Europe, North America and Taiwan. The result is a wonderfully rich set of papers, which cumulatively illuminate a wealth of issues, examples, ideas and opportunities that emerge when assessment is put under the spotlight.

As is becoming our custom, we start with a personal reflection – John Williams considers fundamental positions of value in both assessment and Technology Education. Drawing comparisons between fishing and learning, teaching and assessment, he highlights the key concepts of inputs, evidence and outcomes, and raises the dilemma of balancing manageability with what we fundamentally value. His plea is that we focus on the important, even where less tangible, that

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we recognise the expertise of teachers and that we continue with 'pioneering' and 'dynamic' assessment research into the challenging, intangible but critical dimensions of the subject.

A Scholarly Review by Susan McLaren follows. In an immensely useful charting of the territory, Susan draws together issues and themes in assessment research from the last 15 years, both specifically within our collective field and more generally in education. Focusing on the 'what', 'when' and 'why' of assessment, she identifies the complexity of assessment issues and how these reflect the range of views about the critical components in Technology Education. She identifies the increasing shift towards sustainable and multi-modal assessment and argues the case for further research in these areas.

The papers that follow all variously illustrate the key themes in the Scholarly Review starting with two papers that provide insights into the shift towards assessment for learning and the importance of planning and embedding assessment within learning and teaching practices. The first from Christine Edwards-Leis, takes a specific small-scale research project set in a primary classroom in Queensland, Australia. Through the paper Chris explores the importance of mental models in teaching, learning and assessing primary children learning about robotics. The second, from Judy Moreland, Bronwen Cowie and Alister Jones is also taken from a primary school context, but this time the setting is New Zealand. The paper draws on three different research projects to explore the development of assessment for learning strategies to support teachers dealing with the complexity of learning in technology education. They highlight the importance of planning, of learner-teacher interactions and of multimodal approaches. Both papers provide explicit examples, and also discuss more widely the generalisable issues and ideas raised.

The next paper, from David Barlex, highlights some of the tensions that have been experienced in assessing design and technology, explicitly in the context of the English and Welsh National Curriculum, and makes a plea for a shift to focus on designerly activity and designerly thinking as a way of breaking the gridlock. He provides a case for focusing on design decision

making within culturally authentic design tasks and proposes practical strategies, making use of 'probes' to generate and 'job bags' to gather evidence. As with the previous authors, assessment is seen as embedded, strongly supporting learning and teaching not dominating or directing it.

The fourth paper comes not from Technology Education but from the Swedish subject of Sloyd. In the paper Kajsa Borg tackles the age-old problem of assessing process or product looking particularly at how what teachers assess is governed by concepts and constructs that are articulated through language. She highlights the problems of teachers working in an intuitive and practice based area where communication does not all come through the spoken word and where the educational priorities have shifted from being driven by craft products to creative learning processes. There are strong if implicit similarities between the issues discussed by Christine Edwards-Leis in relation to mental models and the paper provides valuable food for technology educators, where there are some distinct parallels in the context of practice.

We move from this paper to one that considers a complete paradigm shift in the way assessment judgements are made. Richard Kimbell describes pioneering assessment research into new approaches to using new technologies to generate and collecting assessment evidence and to making judgments on the capability being demonstrated. Richard describes the creation of a live, dynamic e-portfolio that is 'marked' drawing on somewhat older concepts of 'pairs judging' and 'holism'. In describing the research, further age-old issues such as norms, criteria, authenticity and capturing the ephemeral are discussed and approaches to using new technologies to support multimodal approaches are exemplified.

Finally we turn to two papers that provide insights into particular national settings – Taiwan and USA. In the first, Lung-Sheng Lee and Kuen-Yi Lin provide an outline of the Technology Education curriculum in Taiwan and how assessment is framed within this. They describe approaches used for formative and summative assessment and illustrate these with an example that also highlights how science is closely linked with technology for teaching learning and

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assessment. They stress the importance of placing the student and their learning at the heart of the process and their belief that improving assessment approaches is critical for improving learning and teaching.

In the final paper Greg Pearson reports on a major two-year study for the National Academies aimed at determining 'viable' approaches to assessing technological literacy within three populations – school students (from kindergarden to Year 12), their teachers and the population at large. The paper focuses on the students. It outlines the definition of technological literacy used in the study and the key components focused: knowledge; capabilities; and critical thinking and decision making. In charting the range of assessment strategies reviewed, the paper provides an overview of approaches that go beyond those identified within North America. The paper identifies the challenges faced in assessing technological literacy on such a large scale but indicates some opportunities for drawing on ideas from elsewhere, such as from the video gaming industry. It also identifies the need for further research, especially in relation to cognitive science.

Throughout the papers, common themes emerge and weave their way through the various contexts discussed. In all there is a quest for focussing on what is important both for the curriculum area and for the learner and increasingly a thrust can be detected for a shift towards assessment that is more embedded, more learner centred, more authentic and less intrusive. What is also patently clear is a belief in the need for more research in this area to take forward effective approaches to learning and teaching.

And so we move to begin to explore the thorny topology of assessment in Technology Education by reflecting on assessment...spirituality...and fishing!

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Obituary

Karen McGee

Karen joined the Design and Technology Association at a challenging time. Plans had been put in place for the new format of the journal before Karen arrived, but it was still becoming established, and the 2005 International Research Conference was just getting underway. Authors, referees and editors are all prone to regarding deadlines as negotiating positions, and it takes someone of a calm and flexible disposition to manage the interchanges successfully. Karen succeeded admirably from her earliest contacts. Email is not the easiest of media on which to impose your personality, but Karen's kindness and good humour were immediately apparent to all. Karen's loss will, of course, be most keenly felt by her family and immediate working colleagues at the Design and Technology Association, but those of us in the research community whose contacts were more distant, will also miss her support. We are grateful for Karen's contribution in helping to shape the new journal and conference publications, and very much regret that it could not have been for longer.



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