Reflection, change and renewal

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Welcome back to Loughborough University! The Design and Technology Association’s International Research Conference has its roots in a rich tradition, which dates back to the establishment of the DATER (The Design and Technology Educational Research and Curriculum Development Conference) in 1988. This was started by the Department of Design and Technology at Loughborough University and directed by John Smith. It was started in order to support the development of a research base for design and technology (D&T) as it emerged within the National Curriculum in England and Wales. For those of us privileged to be at that first conference, there are memories of a strong sense of purpose and determination to help make this initiative a success and some pride can be taken in the achievements of the last 21 years. The contributions that delegates to the conferences have made to the development of a research base can now be searched online. There are now 397 IDATER papers and 119 D&T Association papers online, and there remains around 50 to add. So a good track record.

The history also demonstrates a willingness to adapt to changing circumstances. It was recognised very early that strength came from shared knowledge and understanding, and, consequently DATER went international in 1992, and became IDATER. IDATER was highly successful even in its final year before going online in 2001, and had developed a strong international reputation. In the early years D&T specialist advisory teachers from local education authorities made up a significant proportion of the delegates, but these posts had become much rarer by 2001, and the decision was taken to move the conference closer to teachers by transferring its stewardship to the Design and Technology Association. Without effective dissemination routes even an excellent, well-established conference risked marginalisation. And so, from 2002 the D&T Association International Research Conference sought to become established.

Table 1. shows a summary of some key aspects of the past six years. The starting position in 2002 was similar to the last IDATER conference. The record of continued success is evident. Research papers of good quality have continued to be presented and through them the on-going discussion of emerging issues concerning design and technology education research and curriculum development has continued. There has been some success in supporting contributions from new researchers as Poster and PowerPoint presentations, but that can be seen to have been more limited. The contributions to the 2008 conference follow an essentially similar pattern. There are fifteen research papers of good quality, and the six PowerPoint presentations are particularly welcome in facilitating the discussion of emerging research agendas. Such discussions were a key feature of early IDATER conferences, and a vital aspect of developing timely research agendas. It is important that space is available in the inevitably busy conference timetable for everyone to have the opportunity to contribute to such debates, whether they are a researcher or have a potential interest in the research outcomes.

All this history is only really worth noting, because it is an appropriate time for the conference to once again consider how to renew itself. The research papers are characterised by a spirit of the need for change and curriculum renewal. Government policies are seeking to move curriculum decision-making away from central agencies and towards more innovative, locally driven initiatives. As a first step, all delegates have been given a CD and accompanying poster providing research resources, particularly relating to action research. These new policy initiatives reflect the values and beliefs that many conference presenters and delegates have expressed over the years and the conference should consider how to further support them.

1The IDATER and D&T Association international research conference papers can be accessed through Loughborough University's Institutional Repository at https://dspace.lboro.ac.uk/dspace/handle/2134/97
Some opportunities for such reflection have been incorporated into the Conference structure this year e.g.

• A discussion has been organised on the first day of the conference to consider the development of appropriate research agendas, a supportive research culture and the conference.
• An ‘IDATER Online’ special event concerning action research has been scheduled.

Also, some steps have already been taken to support change. The power of the Internet brings new opportunities. The archiving of past contributions to the research base was an obvious step to have taken, but there is also now an online conference (IDATER Online, http://idater.lboro.ac.uk/) looking at selected research topics and the D&T Association’s journal has been taken online (Design and Technology Education: an international journal, http://ojs.lboro.ac.uk/ojs/index.php/DATE). The current IDATER Online conference concerns ‘action research’ and the next one is scheduled to consider ‘sustainable design education’. The archives, online conference and journal are all ‘open access’ and are linked to a newly created hub at www.dater.org.uk There is great potential for supporting the development of design and technology education both locally and worldwide, and making connections between those with parallel interests. But how best to set about it?

So a proud record and continuous developments are underway, but how are research and practice to become ever more strongly linked to help ensure the future quality of design and technology education?

2008 research papers and PowerPoints
The particular contribution of the paper by David Barlex and Sue Miles-Pearson is that it is exploring the extent to which advances in software and hardware in recent years are enabling primary children to engage effectively with CAD/CAM. The early evidence reported here suggests that it does. Creativity is of course a feature of nearly every contribution this year and the authors consider the implications of maintaining a creative environment within which children can take ownership of design decisions. The relationship between CAD/CAM and creativity is highly complex and it is becoming increasingly clear that simple interpretations of its use as a ‘recording’ and ‘making’ tool are optimistically naïve. Aede Habib Musta’Amal, Eddie Norman and Tony Hodgson report a study at the ‘other end’ of the student age range concerning the use of CAD/CAM by design masters students. It was clear that creative behaviours associated with conventional designing were also occurring when CAD/CAM was used. Previous research (reported in this paper) has shown that ‘skill’ and ‘expectations’ also have an influence on outcomes and there are also important effects from the use of CAD/CAM on student motivation. The potential for on-going research is evident.

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<th>Year</th>
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Table 1 Data relating to the D&T international research conferences 2002-2008
There are three papers, which arise from the research project recently completed at Cambridge University. In the first paper, Bill Nicholl, Ros McLellan and Matt Thomas examine two creative processes emerging from their research project: analogical thinking and conceptual combination. Using a case study the paper aims to help practitioners to understand these processes through exploring how they can be developed in D&T classrooms. Wafa Kotob, Bill Nicholl and Ros McLellan’s paper is the second paper and unusually examines the critical role of technicians in supporting the creative process. It is proposed that there needs to be a redefining of the technician’s role, if they are to have a highly supportive capacity in supporting teachers when engaged in creative practice. Crucially however, such changes can only take place if technicians are involved in the change process from its outset.

The final paper from Cambridge is Ros McLellan and Bill Nicholl’s paper which extends their previous research by examining the classroom climate for fostering creativity in D&T. In particular the paper focuses upon both challenge and freedom concluding there were inconsistencies in the perceptions of teachers and learners related to these two themes. The opportunity to engage with student voice would seem to offer one way to examine these potentially significant differences within a learning environment.

One of the delights of research is observing the progress of parallel studies. Malcolm Welch and David Barlex first reported on their longitudinal study at the 2006 Conference, where Alexandros Mettas also reported some of his early research concerning design decision-making. The studies are differently framed, but essentially concern the decision-making capabilities of children and how these are learnt, the nature of the tasks that are given to children in design and technology that support such learning, the associated classroom interactions, and at least for Metttas, the transferability of such learning to real situations. The two papers presented here are looking at different aspects of these research agendas. Welch and Barlex report on some of the difficulties associated with data gathering for their study, which is being carried out in Canada. In particular they discuss the significance of the teachers’ professional performances for research. Mettas and Norman’s paper focuses on children in Cyprus and how they set about taking decisions. The different research contexts provides opportunities for glimpses of designing as a ‘general human activity’. Something we all do, some better than others of course, and we can all be coached to improve.

On-going research concerning the improvement of classroom practice and pedagogy continues to result in improved understanding. Donna Treball explores the constructive dialogue that can support the development of designerly activity in ‘fledgling designers’. The importance of the roles of language in designing is often under-estimated, and, when learning to design, there is another layer of issues to understand. The paper ends by making the important contribution of a summary of the key features of constructive learning conversations.

Rhoda Trimingham and Dan Home’s paper reports on the evaluation of a pilot CPD (Continued Professional Development) project to support the development of innovative curriculum materials bringing together the recent CAD/CAM in Schools and Electronics in Schools initiatives, which have been developed in schools in England and Wales. Very much in the spirit of the times one of the unusual, and ultimately very successful, aspects of the pilot CPD event was the freedom assigned to teachers to develop their own schemes of work within a supportive and constructive environment. There were many useful research findings, but this one in particular demonstrates the potential there is for teacher-led innovation, if the appropriate environment is provided.

Which all leads to matters of policy. Ruth Wright’s paper focuses on the methodological issues associated with researching the views and beliefs concerning design and technology of the ‘elite’; those who potentially have a strong influence on policymaking. This is an important contribution in itself, but the paper also shows the thematic categories of the key areas believed to be important that emerged from the research, and makes a strong case for a ‘deep conversation’ and strategic review about the nature of design and technology. Some of the agendas which such a review might address are ably explored in papers by Marion Rutland and Torben Steeg. Rutland’s paper explores the Licence to Cook programmes introduced in 2007 as a response to obesity issues. These programmes essentially develop a craft-based, ‘life skills’ response, which is important, but, as the paper argues, potentially to the detriment of Food Technology, and the wider issues such as Fair Trade and food miles, which are addressed in a more broadly-based curriculum. Torben Steeg discusses a range of new technologies from 3D printers (‘fabbing’) to new flexible circuits and their surrounding issues such as education for sustainability and intellectual property protection. He explores the responses that might be made and raises a number of key issues, of which just one is shown below.

- What are the (or, are there) timeless central components of a D&T curriculum that will remain unchanged in a changing world?
This should be the central question for any strategic review of design and technology education. In many ways, this is the question that Gill Hope’s exploration of the nature of knowledge for design and technology education is addressing. To quote from the end of her paper:

It seems to me that, if homo neandertahliensis had know- that and know-how, and passed these on from generation to generation and yet went extinct, we need to do something a bit better for young homo sapiens in the interests of the future of our species.

There remains a need for a fundamental review of the essence of design and technology education.

And then there is ITE (Initial Teacher Education). In such a rapidly changing environment, with all the associated curriculum initiatives, how should those responsible for ITE respond? Mike Martin and Paul Spencer’s paper focuses on a review of subject knowledge demands and challenges the orthodoxy of the Minimum Competences for students to teach Design and Technology in Secondary Schools (1995). It would not be unexpected if a document over a decade old was well passed its ‘sell by date’; and the authors make a strong case that the requirement is now for more reflective and adaptable teachers. The need for locally driven, teacher-led innovation is becoming ever more evident.

All of such debates can be informed by international perspectives and John William’s paper presents an insight into developments in Australian education through the examination of a fascinating initiative linking higher and secondary education institutions. Not only have physical links been developed between the institutions but also links between staff, students and courses have also been made. The project described involved Year 11 high school students and third year university students working collaboratively when studying a robotics activity set in a rich context as part of their Engineering studies. The findings will form the basis of future collaboration and will be of significant interest to others developing similar institutional arrangements.

In addition to the research papers covering an intriguing range of issues, a collection of PowerPoint presentations also reflect the exploration of the concept of a ‘designing continuum’. Kathy Dare’s presentation explores enrichment activities and continuity across the Key Stage 2/3 boundary. Eddie Norman, Tracy Bhamra, George Torrens and Rhoda Trimingham’s presentation is exploring the transition from school to university where there has been little prior research. The emerging roles for new technology are being explored. Irineos Patis’s presentation reports an investigation into the practices, views, knowledge and needs of primary school teachers in Cyprus in relation to ICT. Rhoda Trimingham and Peter Simmons’s presentation looks at the limited impact that sustainable design websites have had on children’s design decision-making and how that might be addressed. Policymaking and the issues of curriculum balance are features of the 2 presentations from Jamie Blackshaw and Kevin Naylor concerning the development of policy concerning food competences and the introduction of Cooking Clubs in the North East of England. The tensions in this important area of the design and technology education curriculum are indicative of those in parallel focus areas.

So, together with the Keynote Addresses which will be published later in Design and Technology Education: an international journal, all is set for a fascinating conference.

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