Annoying Echoes

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I have had the privilege of spending most of my working life at Loughborough University in the Department of Design and Technology, which has now been absorbed into Loughborough Design School. Hence in my early career in higher education I heard inspirational thinkers and speakers such as John Eggleston, Bruce Archer and Phil Roberts at seminars and early IDATER conferences presenting the research challenges and opportunities that lay ahead as design and technology grew in general education. They also provided the theoretical underpinning for designerly approaches to action research and the building of practitioner theory through on-going research conversations. The outcomes of such conversations appeared in the journals established by John Eggleston, which were later developed by Richard Kimbell, and the IDATER conferences initiated by John Smith. All these publications had peer review central to their processes. In due course I was asked to join their Refereeing Panels and Editorial Boards and it has been a continuing honour to support the on-going research conversations within the design and technology research community. So, the following passage from the literature review by Marlene Harris and Valerie Wilson (2003) was clearly going to be mildly irritating for me at least.

> As reviewers we were impressed, and somewhat overwhelmed, by the number of references to D&T in the literature mainly produced by the community of practice. Within the time constraints within which this review was undertaken, we could not hope to do justice to this large volume of work and, therefore, imposed our own rather more limited criteria for inclusion. The review is based primarily on research which has been peer-reviewed for publication in academic journals or published in research reports. This device excludes much action research and also curriculum development undertaken by the 'user' community.
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> We have, however, included evidence from Ofsted reports in order to provide a national picture of the delivery of D&T. We acknowledge that action research has a well-established contribution to make to practice (Stenhouse, 1975). More recently Barlex and Welch (2001) have highlighted the importance of collaboration between education, research and curriculum development in D&T. More generally the role of the 'end-user' in educational research has been recognised. For example, the ESRC's current Teaching and Learning Research Programme makes involvement of users a necessary condition of grant <http://www.tlrp.org>; and for several years as part of its Service Level Agreement with the Scottish Executive, SCRE has organised a Teacher (now Practitioner) Researcher Network <http://www.scre.ac.uk>. In England, The Teacher Training Agency also makes small grants available to teachers who undertake practitioner research with support from HEIs. Theoretical justification for the involvement of teachers in research is provided by Hargreaves (1998), who describes a 'knowledge creating school' as one which investigates the state of its intellectual capital; massages the process of creating new professional knowledge; validates the professional knowledge created and disseminates the created professional knowledge. Therefore, the fact that we found little peer-reviewed research in D&T is no reflection on the activities being undertaken by practitioners. It is more likely to be related to the amount of research funding and/or interest of professional researchers in this topic area. (2003: 60)

The reviewers acknowledged the validity of the approach taken towards building practitioner theory, but seemingly decided to exclude if from their review due to time constraints. At least that was clear. The reference to 'little peer-reviewed research' was more baffling, as peer reviewing was becoming a considerable part of my job by this point, and, after 20 years at Loughborough, I was beginning to think of myself as a professional researcher as well, but no matter. Generally speaking, the review was well-received in relation to the research it focussed on. So, to the 'annoying echoes'.

Loughborough Design School, of course receives, notification of the RSA Student Design Awards and this year there was an enclosed pamphlet *'What's Wrong With DT* by John Miller, accompanied by a summary of a review by Ian McGimpsey of the academic literature on design education in the National Curriculum since its establishment in 1988' (2011:1).

Unsurprisingly this was immediately passed on to me to read with interest. The summary of the literature review starts by describing 'the shape of the literature on DT'. For example:

> Until recently, much of the literature on the impact of DT was based on small-scale studies drawn from narrow practitioner research. A significant proportion of the literature beyond this consists of un-evidenced advocacy for DT, attempts to re-conceptualise DT in response to

> policy and wider educational contexts, and accounts of policy interpretation or application. These might be regarded in a broad sense as 'policy' texts in the sense that they attempt to frame what DT is, how it is practised and how its benefits should be understood. The lack of systematic academic research may have contributed to a lack of criticality about DT in the literature that is available – for example, working with new materials is assumed to be beneficial with little questioning of the value of the new. (McGimpsey, 2011:18)

Really? Where had this come from? So, of course I downloaded the full version. A keyword search had yielded 661 potential texts, which is a moderate, but credible number. But, what review strategy could have been employed as this represents a substantial task?

> This review was, however, significantly constrained by time. Thus it could not be the goal of this review to conduct a thorough review of all these 661 texts. Rather, the review provided a thematic review of all of these articles and texts based on titles and abstracts or summaries, and I conducted a further filtering, according to the aims and concerns of the RSA.
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> This should shape readers' expectations of the review. This review cannot provide a definitive view of DT over the last quarter of a century. It is a necessarily partial view, and one that seeks specifically to provide the RSA with an overview of design on the curriculum that is relevant to their project development aims. (McGimpsey, 2011:4-5)

So, a purposive sample of the titles and abstracts or summaries of selected texts, which certainly did shape my expectation of the review. From this point it hardly mattered what the conclusions of the review were, except that someone might actually think they did represent the academic literature associated with Design and Technology over the last quarter of a century. And so to the annoying echoes.

> Harris and Wilson (2003) in their authoritative review of the literature on the impact of design and technology up to 2002 argued that the literature lacked what they term 'research-based evidence', and that literature on impact was largely based on 'small-scale case studies' drawn from practitioner research and 'concentrates on a narrow area of research interests' associated with the context of practice (Harris and Wilson, 2003, p. v). And it remains the case that peer-reviewed academic research has been a relatively insignificant context of literature production in comparison to a context of teaching practice. (McGimpsey, 2011:5)

It appears that Harris and Wilson excluded practitioner research from their review, but nevertheless reached a conclusion about it, which McGimpsey accepted without actually reading it. Enough I think.

The essential point of this Editorial is to note the need for credible analysis of the academic research concerning design and technology education. I made my start in a paper presented to the 1st International Symposium for Design Education Researchers organised by the Design Research Society and Cumulus in May, 2011. This paper was peer reviewed. Its main aim was to explore the effectiveness of small-scale research projects. The words 'small-scale' are seemingly used as a means of discrediting such research contributions. But can this position actually be upheld? This is the introduction to my paper.

> Perhaps the appropriate place to begin this paper is by noting recent views on the nature of effective research contributions in education. It is not possible to explore these positions extensively, but they place the discussion of effective research contributions in design education within one of their wider contexts.
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> *Educational research has long been criticized for its weak link with practice. Those who view educational research as a vehicle to inform improvement tend to take such criticism more seriously than those who argue that studies in the field of education should strive for knowledge in and of itself. (van den Akker et al, 2006:4)*
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> This quotation is taken from the introduction to the book of edited contributions concerning 'design research'. So, it can be seen that mentioning this work introduces both context and the potential for confusion. However, this is their description of this research strategy.
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> *…design research may be characterised as:*
> - *Interventionist: the research aims at designing an intervention in the real world;*
> - *Iterative: the research incorporates a cyclic approach of design, evaluation, and revision;*
> - *Process orientated: a black box model of input-output measurement is avoided, the focus is on understanding and improving interventions;*
> - *Utility orientated: the merit of a design is measured, in part, by its practicality for users in real contexts; and*
> - *Theory orientated: the design is (at least partly) based upon theoretical propositions, and field testing of the design contributes to theory building (ibid: 5)*

> The authors of this book clearly believe that 'design research' offers an effective strategy towards meeting the criticisms of conventional educational research. So, perhaps the research question that this paper is ultimately addressing is this.
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> *Are Effective Contributions In Design Education Research Significantly Different To Effective Research Contributions In General Education? (Norman, 2011:53)*

Interested readers can download the paper to view the evidence I presented and my conclusions, but the essential matter here is that assuming that 'small-scale' research is ineffective is merely assertion unless there is associated supporting evidence. The continued exclusion of peer reviewed, small-scale practitioner research into design and technology education has yet to be justified, and there are around 2000 such contributions to be found at the DATER hub (www.dater.org.uk). A credible literature review would either include these or be sufficiently focused on a particular topic in order to justify appropriate selection strategies.

This issue includes the published version of the John Eggleston Memorial lecture presented by David Barlex at the Design and Technology Association's Education and International Conference in July 2011 and 5 further research contributions. David Barlex's lecture is published as a scholarly review. It provides a personal perspective from an experienced researcher and curriculum developer. It is entitled 'Dear Minister: This is why design and technology is a very important subject in the school curriculum'. I hope the Minister agrees.

The paper by Alanah-Rei Castledine and Dr Chris Chalmers explores the use of Lego Robotics as an authentic problem solving tool. There has been a long-standing concern about the relationship of the Design and Technology curriculum to real world contexts. It matters because design and technology educators generally have a specific aim of (something like) enabling children to intervene creatively in the made world. All educators have aims of a similar kind of course, but for design and technology they are perhaps a higher priority. This is a detailed study of the problem-solving strategies of 23 pupils at a Brisbane primary school.

The paper by Dr Ken S. Gibson and Dr Irene Bell, examines the attitudes of design student teachers in Northern Ireland to Mathematics within Technology and Design. The aim of the research is to consider whether students' attitude to Mathematics is different when the subject content is presented within or outside their own subject area. This is again a long-standing issue, as there have been numerous reports of the difficulties caused by the attitudes of design students to mathematics. The research was conducted within the STEM (Science, Technology, Engineering and Mathematics) context, in which it is commonly assumed that subjects like Technology and Design are supported by Mathematics. They can be, but it all rather depends on the students capabilities' and willingness to transfer mathematical concepts into their designing activities.

Richie Maolosi's paper concerning the teaching of cultural concepts in Design and Technology in Botswana reflects the growing maturity of research in this subject area. As the rapid expansion of design and technology education occurred during the 1990s and 2000s curriculum models were adopted that have not proved to be entirely appropriate. 'Second generation' curricula are now being developed in a number of countries, which are providing a new set of challenges. The articulation of the meaning of culture and its inclusion within particular design curricula is one of those challenges, and the initial analysis is presented in this paper. It is possible to look forward to a time when an appropriate diversity of design and technology syllabuses have evolved across the world and a rich spectrum of interpretations.

Marja-Ilona Koski, Remke Klapwijk and Marc de Vries's paper explores and develops another key area, the relationship of concrete objects to their social context and abstract knowledge. The links to the previous papers are apparent, and this paper offers a theoretical model of these three knowledge domains. It reports research using this model to analyse, explain and suggest improvements for training primary school teachers in the Netherlands. The development and validation of such theoretical models is an important contribution to the on-going international conversations about Design and Technology and its appropriate place in educational curricula.

The fifth research contribution in this Issue is from India. Farhat Ara's paper reports the outcomes of an investigation of middle school students' ideas of design and designers. A survey was conducted in a school in Mumbai and the paper reports the conceptions of designing that the students held without any experience of Design and Technology education. There are evident implications for curriculum development in India, but in the context of international on-going conversations, there is also a wider contribution.

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This issue also contains Richard Kimbell's Reflection piece on 'Frozen history', a review by David Spendlove of Jane Pirto's new book *Creativity for 21st century skills: How to embed creativity into the curriculum*, and a review by Steve Keirl of the 2011 PATT & CRIPT Conference recently held in London and a review of Patricia Morrell and James Carroll's new book *Conducting educational research: A primer for teachers and administrators* by Steve Keirl and Christine Edwards-Leis.

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