# Primary Design and Technology: Making the difference

Professor Clare Benson, CRIPT, Birmingham City University
Dr Gill Hope, Canterbury Christ Church University
Dr Julie Lunt, CRIPT, Birmingham City University and the Design and Technology Association

We are delighted to introduce this special edition of the journal focusing specifically on primary design and technology. It is the first time that the primary phase has had a dedicated issue and fittingly it coincides with the twentieth anniversary of the first time that design and technology was specified in a national curriculum for children of this age. During the last twenty years the subject has evolved and developed becoming established in many countries across the world. Design and technology appears in various forms and has a distinctive character in different countries including being known by a range of titles (e.g. Design and Technology, Technology, Science and Technology). This international dimension and the variation of practice are reflected in this edition with research from New Zealand, Germany and England.

It is perhaps a sign of increasing age that 1990 feels as if it was not that long ago. However, during those twenty years – a relatively short period of time – much has been achieved in primary design and technology education. Many developments have been supported and enabled by the discussions and debates among members of the growing international community of researchers concerned to improve and develop practice in this area. It is interesting to note that twenty years ago this journal did not exist and nor did the various conferences which have brought together researchers from across the world. In this edition, for example, are published the abstracts from the Seventh International Primary Design and Technology Conference hosted by The Centre for Research in Primary Technology (CRIPT) in Birmingham, England. The aim of this biennial conference is to encourage teachers and new researchers to share their work as well as providing a forum for more experienced academics. This opportunity for growing new talent is essential for the subject to flourish and be sustained into the future and therefore we are pleased that this special edition features articles written by researchers who are either relatively new to publishing their work or who have not previously submitted articles to this journal.

The last twenty years have also seen quite remarkable changes in the technology that many children experience on a daily basis. The notion that design and technology education should aim to help children to respond creatively, critically and effectively in a rapidly changing world of technology is one which will continue to challenge us as educators. To what extent do the learning experiences we offer our children fulfil that aim? And what about the potential use of technology in teaching and

learning processes, such as that investigated in the e-scape project? Twenty years is a drop in the ocean when one considers developing a 'new' curriculum subject and there is inevitably a long way to go. However long journeys have their own beauty and opportunities for inspiration as Richard Kimbell reminds us in his reflection piece in which he paints a vivid picture of a journey he made across the Nullarbor desert in Australia. Kimbell provides us with a colourful metaphor to play with when thinking about classrooms and research.

The five research articles in this edition touch on two significant themes in primary design and technology: firstly, the implications of linking design and technology with other elements of the curriculum; and secondly, issues related to teaching and learning.

Cross-curricular work was the theme of last year's special edition and continues to be an international trend of interest to many working in the field of design and technology. As a relatively new subject, and one which often does not enjoy a high status or a good level of understanding, design and technology is particularly vulnerable to distortion when linked with other subjects or when used to further other curriculum aims. This is a concern emerging from the findings of Eric Parkinson's research in England where two major reviews of primary education are encouraging a more cross-curricular approach to curriculum planning (Alexander, 2009; Rose, 2009). In his article Parkinson argues that in a period of curriculum flux, such as that currently being experienced in England, it is important to preserve the identity of design and technology as a subject which is worthwhile in its own right rather than allowing it to be subsumed by topic work. He concludes that in cross-curricular planning there is a danger that design and technology is misrepresented as being simply about 'making things' and the activities children engage in are limited to representing 'looks like' or 'works like' artefacts from the past rather than modelling new possibilities. Children are thus deprived of opportunities to develop their design capability and hence the full range of cognitive, practical and life skills which the teachers in his research saw as being important outcomes of design and technology education.

In New Zealand policy directives see design and technology as a key medium for delivering Education for Enterprise. In his article Gary O'Sullivan investigates this relationship developing an integrative model placing technology education as the central pivotal theme of a

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tripartite relationship involving Education for Enterprise, Community Partnerships and the School Curriculum. He outlines four theoretical perspectives that can be used to consider the nature of these links. From his research with teachers during this project O'Sullivan has identified key success themes emerging from the data. Like Parkinson, he emphasises the importance of teachers having a robust personal construct of the subject in order to ensure that successful links are made for children.

The second theme – teaching and learning – will always be highly relevant in our endeavours to improve children's experience in design and technology. Wendy Fox-Turnbull from New Zealand provides us with a review of recent literature in the area of conversation and dialogue with the aim of gaining a better understanding of the role that conversation and dialogue plays in learning. She adopts a constructivist perspective and argues that to enhance learning in technology teachers need to facilitate and develop quality conversations with and between their students about technological practice, knowledge and the nature of technology but acknowledges that in the reality of classroom life this is not always easy. The nature of design and technological activity means that teachers have to be disciplined to ensure that sufficient attention is paid to conversations about learning and practice and not just management and organisation issues.

Michael Drain's article, also from New Zealand, takes a systematic view of the practices of a teacher and her students in a design and technology unit of work on pop-up books. In his analysis he applies the Cognitive Apprenticeship (CA) framework, an analytical tool which has been developed out of situated cognition theory. In his article Drain outlines the four dimensions of this framework matching them to the events and practices observed during the unit of work. He concludes that the evidence provides a theoretical justification for a two-phase teaching approach in which the teacher supports the development of knowledge and skills during the first phase of a project in preparation for a second phase in which children engage more independently in a design and make activity. Drain suggests that this analytical tool might also be used to good effect as a planning tool.

Finally, the third article related to our teaching and learning theme is from Germany. Julia Menger's research study investigates the development of children's thinking processes when learning about simple machines. In her article she describes a theoretical model she developed from the findings of an empirical study in which she observed a group of children undertaking a problem-solving task and followed this up with a semi-structured interview. Her findings emphasise the importance of practical activity and group work in the learning processes in this context which has a strong emphasis on developing scientific understanding through technological activity.

Teaching and learning is also a theme addressed in the two books reviewed in this special edition of the journal. The final report of the Cambridge Primary Review: 'Children, their World, their Education' is an impressive summary of an extensive project which is likely to be of interest to any researcher in primary education - even though, as our reviewer points out, the subject of design and technology is poorly represented. It is a comprehensive book documenting far more than just research and surveys, providing a context for, and a very informative background to English primary education. Creative learning 3-11 is the theme of the second book which offers international perspectives on this subject with contributions from policy makers, researchers and practitioner researchers from across Europe, the USA, China, India, the Caribbean and the Gulf States.

Whatever phase you are involved with, we do hope that you will find something of value that enhances your own work and practice in this special primary edition of the journal. We look forward to the continued development of primary design and technology across the world and a strengthening of the community of people who together work towards that goal.

## References

Alexander, R. (2009). *Children, their World, their Education: Final report and recommendations of the Cambridge Primary Review.* London: Routledge.

Rose, J. (2009). *The Independent Review of the Primary Curriculum: Final report.* London: Department for Children, Schools and Families.