Making Ends Meet

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It is always a matter for particular celebration when a practitioner completes a part-time PhD. (Dr) Alexandros Mettas who works in Cyprus will complete his PhD in January 2012. I, at least, am of the view that completing a research project, whilst being also employed as a teacher or lecturer, is more challenging than the full-time alternative. Of course, Alexandros has many equally notable predecessors, and too many to start naming them individually, and our congratulations are due to them all on the contributions that they have made to building practitioner theory. However, I have a particular reason for referring to Alexandros Mettas' research here, as there currently seems to be a need to reassert the nature and importance of practitioner theory.

In a sign of hope for the policy discourse surrounding design education The Design Commission have recently published a report entitled *Restarting Britain: Design Education and Growth (2011)*. The Commission posed 4 questions: Why does design matter?; Where are we now with UK design education?; What are our competitor nations doing?; and What must we do to continue to compete? The Commission was concerned with UK design education at all levels, and had an essential focus on economic performance that was probably inevitable in current circumstances. Nevertheless, it drew on a wide range of evidence, and explored the wider context of design education, and hence although it is in my view an essential read for UK design educators, it also potentially has value for international readers. The following extracts provide a flavour of the report which can be freely downloaded.

> We believe design is a lever for growth.
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> Design has been proven to boost the competitiveness of businesses, selling more British products and services. Design can and does unlock the commercial potential of the UK's research base – the sciences, engineering, new technologies, digital industries – by synthesising and translating between bodies of knowledge, communicating emerging ideas, and finding marketable uses for them. Design is also the hallmark of an enterprising and socially mature society. Better schools, hospitals, streets, public services, workplaces – all the things that make civilised societies function well – are dependent on good design.
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> The Government does not seem to fully appreciate this lever, or the significance of design as the spine that runs through industry, innovation, and social wellbeing. (ibid:6)

…and later…

> Design is, at basis, a decision-making, and problem-solving, activity. Learning to think as a designer means learning how to approach problems and make decisions in a particular way, in order to arrive at a positive outcome: a new product that customers love, a new service that saves time and money, a new environment that promotes well-being. The 'designerly' approach is differentiated from any other way of making decisions by how one goes about gathering the information needed to make the decision, how learning happens, and the attitude to doing so. This involves a blend of thinking and acting, learning through doing – testing ideas and assumptions through action – rather than, for example, historical data – edging towards a solution. This natural inclination to create and invent, to find new solutions and make new things, is in fact a remarkably human and age-old approach to problem-solving, and underpins the technological progression of human societies over thousands of years.
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> Design is also distinguished from other problem-solving processes by allowing for the apparently irrational elements of human nature, admitting the incorporation of intuition, human-centred understanding, and emotion – or the effects of emotion – into decision-making. (ibid:8)

So the Commission has captured the complexity and importance of designing as a task, but. at least to my reading, has not captured the difficulties and complexity of teaching and learning in this area. For example:

> To be appropriate in the 21st century context, we need to shift education to an interdisciplinary approach. In other words, from a system that operates in discrete specialist subjects, towards an integrative system that promotes adaption as skills needs change. Schools should use the naturally interdisciplinary nature of design projects to break down silos between subjects. This could be as simple as setting design challenges that engage students outside their subject classes in creative problem-solving projects. (ibid:12)

Well it all rather depends on what 'as simple as setting design challenges that engage students outside their subject classes' is taken to mean. Figure 1 shows Mettas' model of the factors affecting children's decision-making in design and technology education.

This model was formed through the analysis of published literature, the analysis of data relating to the National

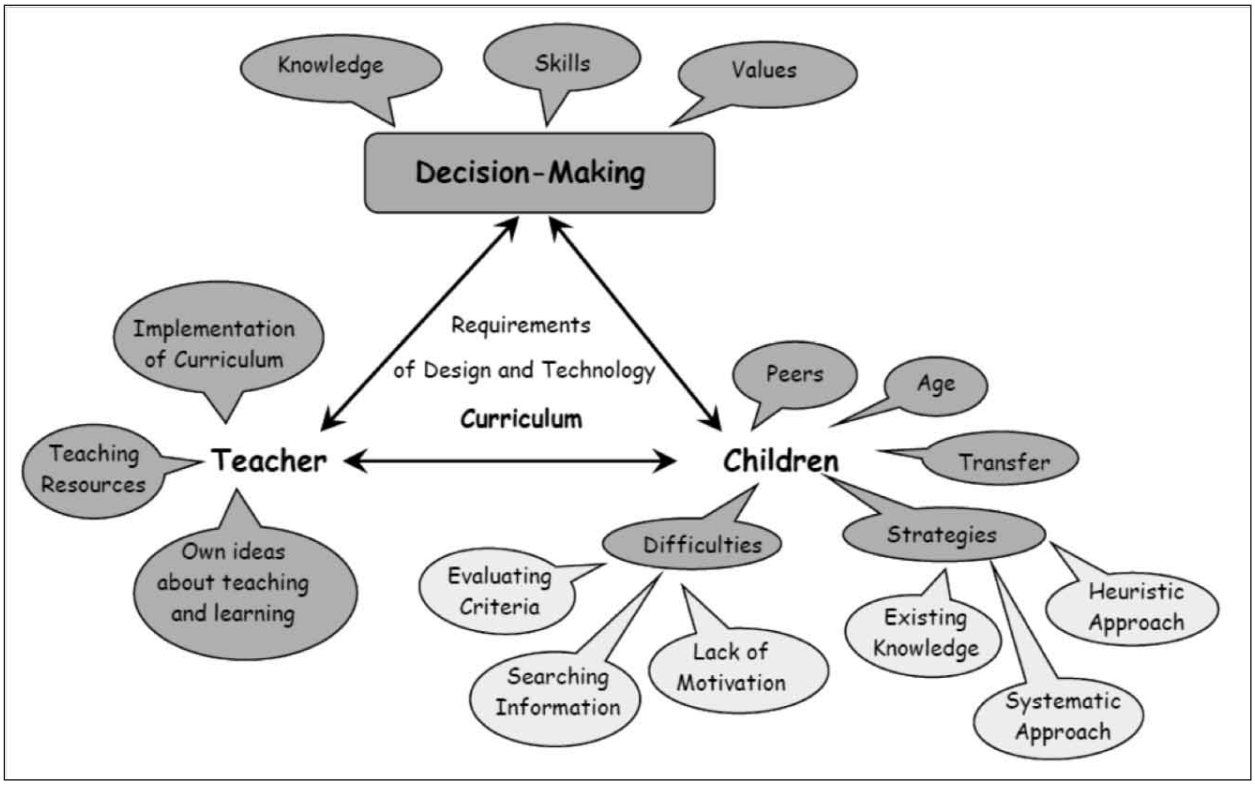

Figure 1. Model for factors affecting children's decision-making in design and technology education (Mettas, 2012:188)

Curricula and interviewing teachers from Cyprus, England and Iceland, and through the analysis of data derived from observations, tests and interviews with children in Cypriot classrooms. The decision-making of professional designers or design teams relates to the knowledge, skills and values to which they have access. Students will not have access to the same knowledge, skills and values, and the task that the design of the curriculum must seek to resolve is scaffolding the transition. Children will be at different developmental stages and each child will face their own issues in overcoming the difficulties, developing decision-making strategies and coping with socio-cultural influences. Teachers must seek to bring children to within their Zone of Proximal Development to use Vygotsky's term, whilst meeting the curriculum requirements. If 'outside their subject classes' suggests increasing the teachers' freedom of action, then that might well be a way forward. Defining particular requirements for teaching, learning and assessment of Design and Technology has not got a strong track record of success in the English National Curriculum at least.

Unsurprisingly most approaches to resolving this curriculum design task have been tried over the last few decades and many of them reported in published research. Each of these has involved teachers in seeking to resolve these matters through designerly approaches (Archer, 1992) 'thinking and acting and learning by doing', as The Design Commission report rightly notes. They were each contributions to the development of practitioner theory that were made in the context of their time and place. Alexandros Mettas' research was conducted in Cyprus. Of course, we would all like to know whether the same outcomes would result in other countries. There is an international dimension to his research through the analysis of published literature and triangulation across 3 countries, which provides some basis for general statements to be made, but it is, of course, limited (…essentially by what it is possible for a full-time practitioner to achieve through part-time research). Nevertheless it remains an excellent contribution to the building of practitioner theory and one strand in what can eventually provide design education practice with robust supporting research foundations.

The great contribution of the founders of the design education movement in the 1960s and 1970s was to both articulate the nature of design and designing, and lay the foundations for their pursuit through practice and research within general education. The Government and

the Design Commission are concerned with 'Restarting Britain'. Design educators are concerned with giving their students the best possible experience of learning to design. Researchers in design education strive, and have striven, to build practitioner theory to support practice through designerly approaches. To these ends must be added the need to ensure a sustainable future for society in relation to the environment. Designerly activity provides a framework for creative approaches to making these ends meet, and within which the complexity of the task that design education represents can be fully recognised. If that is one of the outcomes to which The Design Commission report contributes, then it has served us well.

A further Expert Panel has also recently reported on the future shape of the National Curriculum in England (2011). A comparison of these two reports makes for interesting reading, but, in particular, consider the justification that is implied for reclassifying Design and Technology to be part of the 'Basic' rather than the National Curriculum.

> 4.8 Despite their importance in balanced educational provision, we are not entirely persuaded of claims that design and technology, information and communication technology and citizenship have sufficient disciplinary coherence (footnote 58) to be stated as discrete and separate National Curriculum 'subjects'.
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> …(footnote 58) Implicit in this judgement is a view of disciplinary knowledge as a distinct way of investigating, knowing and making sense with particular foci, procedures and theories, reflecting both cumulative understanding and powerful ways of engaging with the future. In this sense, disciplinary knowledge offers core foundations for education, from which the subjects of the curriculum are derived. Some very worthwhile areas of learning apply such knowledge in particular ways or foreground particular areas of skill or competence – but have weaker epistemological roots. Our judgement about possible reclassification is based on the balance of advantage, given the need to reduce prescription in the National Curriculum. (2011: 24).

It would appear that the Expert Panel is suggesting that designerly ways of knowing do not represent 'distinct ways of investigating, knowing and making sense with particular foci, procedures and theories, reflecting both cumulative understanding and powerful ways of engaging with the future'. It is hard to see how The Design Commission could ever agree with such a viewpoint. Of course I do not agree with such a characterisation of designerly ways of knowing as having 'weaker epistemological roots'. Less well understood it may be, but it seems highly unlikely that such a perspective would find any support, from anyone, practitioner or researcher, in the design field. It is not entirely clear what the Expert Panel is proposing as the 'Basic' curriculum would appear to be compulsory and the recommendation is 'that design and technology programmes should be developed by schools in response to local needs and interests' (ibid: 24). Perhaps this will come to be seen as a positive step forward as clarification emerges, but it looks more likely to be a further weakening of the hard won gains of the past decades. It would be my view, unsurprisingly of course, that such reviews as these would make more progress towards 'making ends meet', if more careful attention was paid to the practitioner theory that has been established.

The paper by Dr Michael Gaotlhobogwe concerns the exploration of the impact that a lack of resources might have had on declining students' enrolments in Design and Technology in Botswana. Design and Technology remains an important subject that the Government seeks to support, but there has been a decline in the number of students choosing to study the subject. This paper reports the results of analysing interviews conducted with students in order to establish the reasons behind this decline.

Dr Ken S. Gibson's paper concerns the effects on awareness of engineering and technology that a short period of industrial placement had in the context of Northern Ireland. The students had opportunities to work shadow engineers and technologists, and the impact of these experiences on their perceptions were analysed. Technology and Design, as this subject area is known in Northern Ireland, has a significant part to play in the teaching of STEM (Science, Technology, Engineering and Mathematics), and this paper reports research relating to one strategy that could help student teachers to be better prepared for this role.

These matters are discussed further in the Reflection… *Your Curriculum*…by Professor Richard Kimbell in this Issue.

The paper by Dr Richie Moalosi, Shorn Molokwane and Gabriel Mothibedi investigates the use of a design-orientated project at the University of Botswana to attain graduate attributes. There are high expectations of Design and Technology educators and not only in relation to areas like STEM that are often identified as being directly related. This paper concerns the analysis of a research project that was intended to develop wider graduate attributes, such as communication, problem-solving, teamwork, creative thinking, research and inquiry skills. It is important to be

able to fully articulate the contribution that design education can make, and papers linking design and technology to its wider contexts and other subjects in the curriculum support this key objective.

Muhammad Tariq Bhatti's paper concerns the dimensions of good university teaching. It gathers evidence from faculty and department chairs' perspectives in universities in Pakistan in order to explore the nature of effective teaching. The research was not conducted within a Design and Technology context, and consequently some care and reflection are needed in interpreting its findings. However, Design and Technology education does not benefit from isolation within general education, and, when the opportunity arise, it is appropriate to provide the opportunity to build bridges. Although Design and Technology education poses particular challenges as indicated earlier in this Editorial, insights derived from any area of the curriculum concerning effective teaching are potentially important findings for design and technology educators

The paper by Pirita Seitamaa-Hakkarainen, Kaiju Kangas, Anna-Mari Raunio and Kai Hakkarainen concerns the analysis of computer-supported collaborative designing in elementary classrooms in Finland. The case study presented concerns the experiences of 12 year old students working on an architectural project under the guidance of their teacher and a professional designer. The students were engaged in all aspects of design processes, such as analysing the design of existing houses, analysing the building site, determining building volume, design facades, and floor plans; they formed seven teams, each of which had its own house to design. The data-analysis relied on the Knowledge Forum database, consisting of students' notes, pictures, sketches, and photos. This is an important contribution concerning the analysis of well-scaffolded interdisciplinary project work.

The paper by Maria Svensson, Ann Zetterqvist and Åke Ingerman concerns the analysis of young people's experience of technology systems in Sweden. 18 Swedish young people were interviewed in order to shed light on how they experience the structure, function, and interaction of systems relating to bananas, electricity and mobile phones. The research adopted a phenomenographic approach, and following transcription of the interviews, 6 categories emerged through which the young people's experiences could be articulated. This is a further important contribution towards understanding the interaction of humans and the systems that support them, which is an aspect of the Swedish National Curriculum, as well as those of many other countries.

This issue also contains a review by Nigel Zanker of the 7th Edition of *Research Methods in Education* by Louis Cohen, Lawrence Manion and Keith Morrison, and a review by Marion Rutland of *The Pedagogy of Creativity* by Anna Herbert.

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