MAKING SENSE

'Material' thinking and 'materializing pedagogies'

CAROLE GRAY and GORDON BURNETT

Abstract: This paper outlines aspects of recent thinking and practice that contextualises ongoing research (by the authors) in the experimental exploration of 'knowing through making'. It offers a distinctive perspective on the notion of 'interactive discourse' in craft research and education through the concepts of 'material thinking' (Carter 2004) and 'materialising pedagogies' (Bolt 2006). We take as our philosophical touchstones Dewey's important insights on 'art as experience', Schön's concepts of the 'reflective practitioner' and 'knowing in action', and Bruner's 'constructivist learning' - through doing, through practice in relation to social interaction. We briefly discuss two historical explorations of 'making sense' in architecture and biology (Gaudí Crick and Watson), then concentrate on recent thinking and practice in the creative arts (Carter Bolt). The paper concludes by offering for consideration principles for curriculum development in craft higher education.

Keywords: 'material thinking', 'knowing in action', 'making sense' ''materialising pedagogies', reflective practitioner'

Introduction

> The sense of increase of understanding, of a deepened intelligibility on the part of objects of nature and man, resulting from esthetic experience, has led philosophic theorists to treat *art as a mode of knowledge*, and has induced artists, especially poets, to regard *art as a mode of revelation of the inner nature of things that cannot be had in any other way.*
>
> —Dewey (1934) *Art as Experience* (p. 300 authors' italics)

Dewey's insight of eighty years ago resonates today very strongly as art (creative practice) is now an increasingly acknowledged experiential mode of inquiry that, when firmly located within a research framework[1], can reveal insights and understandings in ways that expand our capacities for 'knowing'. The notion of 'making sense' can not

Interactive Discourse, November/December 2007, Vol. 1, issue. 1.

only be taken as making (in craft practices) through sensory exploration, but also as 'sense making' – creating critical understandings about that practice both through action and reflection on it (Schön 1983).

Ongoing collaborative research – a dialogue between two makers (Burnett and Gray) -involves two methods to structure and analyse this process - one reflective and one active:

1. *Sense Making*

   A conversation (captured digitally) about two completed pieces of creative work (one by each author) reflecting on our experiences of making, what we have come to understand about this, and what might be different ways of knowing. Through this we exercise Schön's 'reflecting on action'.

2. *Making Sense*

   A project that actively and speculatively explores making, in which we each talk about our understandings (captured digitally) during this process (carried out in separate locations). For this we are using ARP (Art as Random Process Watson 1992). The use of this framework eliminates preferred ways of working, taking us out of comfort zones, and encouraging new thinking. Through this we exercise Schön's 'knowing in action' - "the characteristic mode of ordinary practical knowledge" (1983).

Through collaboration and dialogue we can exteriorise what would normally be implicit in the making, and try to map out how we come to know. Through active and reflective methods we are attempting to question our assumptions about making and its value in terms of knowledge. This exploration may reveal new/alternative ways of knowing or develop our understanding of concepts we need to understand better and make more explicit, for example knowing embodied in the process of making and knowledge embodied in the object made.

As precursors to current work on 'material thinking' there a number of historical examples that compellingly demonstrate the value of 'making sense' - things that could never have been possibly understood without some imaginative approaches involving 'making'. For example, Antonio Gaudí's startling stereofunicular model of the Crypt in the Colonia Guell (1898-1914), a hanging set of catenary curves using string weighted with lead balls, which when viewed through a mirror directly beneath, gave an image of a proposed complex vaulted ceiling[2]. In attempts to understand the complex structure of DNA, Crick and Watson began making experimental improvised structures in wire and metal around a laboratory retort stand. The eventual model (finalised in 1953[3]) was a materialisation

of what had hitherto been presented as two-dimensional data, such as Franklin and Gosling's x-ray diffraction photo of wet DNA (May 1952). With simple materials - string, lead, wire, metal plate and resourcefulness with things to hand (mirror, retort) – abstract and complex insights and understandings may be had.

Context: 'making sense', 'material thinking' and 'materializing pedagogies'

There are several important recent contributions to the current discourse on experiential knowledge (for example Barrett 2007). However, for the purposes of this paper we concentrate on the work of two Australian artist-researchers – Paul Carter and Barbara Bolt (both at the University of Melbourne)[4] to give us a context for 'making sense'.

Paul Carter's *Material Thinking: the theory and practice of creative research*

Carter (2005) has proposed the term 'material thinking' – a specific kind of thinking that

> occurs in the making of works of art. It happens when the artist dares to ask the simple but far-reaching questions 'What matters? What is the material of thought?' (p. XI, 'Preliminary Matters')

The purpose of his imaginative and surprising book is 'to articulate the character, techniques and outcomes of creative research in a way that preserves the material difference of its discourse' (p 7). He calls for the recognition of 'the creative intelligence' of materials and the 'plastic wisdom of the craftsperson'. However, this is not a hermetic practice, an exclusive dialogue between artist and materials. Rather 'good techne' is the 'craft of shaping or combination – open to criticism and correction' (p XI), which is why the core of the book is a discussion of six artistic collaborations between Carter and various other creative practitioners including a dancer, a film-maker, and other visual artists. The outcomes of these collaborations demonstrate 'local knowledge' – what Carter claims is one of the 'distinctive yields' of creative research (p XII).

Collaboration is a way of understanding the value of practice beyond its significance to the individual artist. Here he alludes to the *work* of art, as cultural and social agency, and the role of works of art in the 'ethical project of becoming (oneself in a particular place) … essential knowledge if societies are to sustain themselves'. Carter considers collaboration as an important method of creative practice - "passing the shuttle of creative vision back and forth" (p 5) in a relationship of 'give and take' that

heightens sensitivity to *kairos* – critical timing in decision making, helping to develop 'right timing'. In this sense he considers material thinking as 'poised thinking'. Through the give and take of dialogue in a search to find the right words an articulation of embodied knowledge might emerge enabling discourse.

Carter's specific contribution to preserving 'the material difference' of the discourse of creative research lies in his very deliberate use of language (hence the extensive use of quotes in this section). He employs the terminology of making, for example in the chapter titles 'A Pattern Made of Holes' and 'Offcuts of Infinity', and makes great use of metaphor - for example, weaving. He goes back to de Quincey's description (in the 1880s) of discourse - '*discurrendo* - by running about to the right and the left, laying the separate notices together, and thence mediately deriving some third apprehension' (p 5). So discourse becomes the shuttle that weaves together two different threads of thought, creating 'a cross-weave of thought' as material thinking.

Carter sees material thinking as highly responsive and open to possibilities where 'matter becomes mobile' (p 182). To emphasise this he offers the concept of 'humid' as a way of expressing its **'**malleability, plasticity, composite, elastically diffused, becoming'. So material thinking is 'humid thinking' - 'being the product of complication, it is materially promiscuous, eager for recombination'. Extending this into colloidal systems e.g. 'fogs, mists, smokes; paints, muds, slurries; milk, blood and even bone' Carter suggests 'Discourse as dust, in which the suspension of meaning made sense' (p 190).

These speculations are extremely poetic. This choice of language reinforces his argument that 'whenever the discourse about invention finally became separated from the inventive process, it ceased to be poetic' (p 9), reminding us that the Greek *poiesis* means creative making.

To return us to the focus of our paper – a consideration of the pedagogy of craft – Carter presents some engaging ideas about craft (in the sense of 'resourceful wit'):

> Craft is associated with a gift for ambiguity. It is a skill in loosening positions that have been fixed. … It dissipates powerful oppositions and creates opportunities. … but it's also a gift for putting things back together in a different way. … The capacity to perform … depends on advanced material knowledge. (p. 179)

In loosening, dissipating, re-combining we might suggest that craft is a humid practice. At the same time it seems important to acquire a deep and specific understanding of the materials, tools and techniques - 'One who thinks materially has to be a specialist in alloying' (p. 179).

It is no wonder that the concept of 'material thinking' has been enthusiastically embraced by practitioners and theorists (especially in Australasia) as a new methodological approach for 'creative research', and for the development of its specific vocabulary and pedagogies[5].

If Carter has stirred our imagination through the introduction of poetic and startling concepts like 'humid thinking' and 'discourse as dust', Barbara Bolt, a painter, has punched us in the gut with 'working hot'[6] a performative approach to practice that gets our hands dirty (Bolt 2004). Out of this she has developed important thinking towards the concept of 'materializing pedagogies', underpinned by the theories of Martin Heidegger.

Barbara Bolt's 'Materializing pedagogies'

In this important journal paper Bolt (2006) calls for the development of an 'alternative pedagogy to the conceptually and contextually driven one that currently dominates art education' – one that grounds understanding in material thinking as a result of the interaction between two intelligences – that of material itself and that of the artist's creativity.

> Words may allow us to articulate and communicate the realizations that happen through material thinking, but as a mode of thought, material thinking involves a particular responsiveness to or conjunction with the intelligence of materials and processes in practice. Material thinking is the magic of handling. (Bolt 2006)

'Handling' and 'handlability' are Heideggerian terms that Bolt uses to ground Carter's 'material thinking' within philosophical frameworks. According to Heidegger we come to know the world theoretically only after understanding it through active use, through manipulation - through 'handling'. Bolt demonstrates this with an analysis of David Hockney's 'hands on' investigations of historical drawing practices ('Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters' 2001). She presents this as an example of a practice-led research methodology in which Hockney literally *draws out* his emerging understanding through this practice and his long-standing immersion in it. The outcome is a new insight, a 'very specific sort of knowing' as a result of deep engagement with the tools and technologies of making. Bolt points out that this echoes Levinas' notion of 'originary' – 'a way of understanding that derives from, or originates in and of the thing in question – i.e. in this case practice'. She proposes that Hockney has developed a 'visual argument':

> [T]he double articulation between theory and practice, whereby theory emerges from a reflexive practice at the same time that practice is informed by theory. (Bolt 2006)

In championing 'handling' Bolt is not suggesting a return to a skills-based pedagogy, rather a 're-conceptualisation of the human-tool relationship'. In this we must re-cast materials and tools as 'co-responsible' in the creative process and afford 'indebtedness' to them (drawing again on Heidegger's 'The question concerning technology')[7]. In this re-conceptualisation technologies become 'collaborators in the revealing of being'. Bolt also suggests that we need to develop a 'post human understanding' of creative practice, one in which we are intimately bound with technologies, especially new technologies that are responsive, interactive and that extend our creativity in unforeseen ways.

She concludes by proposing that 'material thinking is the logic of practice'. Tantalisingly the paper stops short of proposing exactly how these ideas might be realised in curricula.

Principles for curriculum development in craft education

From this brief overview of key thinking and practice we can propose some considerations for the development of the higher education curriculum in craft.

There has been a widely held belief that craft lacks a robust critical context (Johnson 1995). This can no longer be justified as the past twelve years has seen a development of key texts such as 'Abstracting Craft: The Practised Digital Hand' (McCulloch 1996) and important platforms for discourse e.g. UK Crafts Council 'Making it' conferences during the 1990s; 'Challenging Craft' international conference (initiated by Burnett 2004), 'New Craft: Future Voices' (University of Dundee 2007), 'Neocraft' (NSCAD University, Halifax, Nova Scotia 2007). In parallel, the development of practice-led research (doctoral and post doc) in craft has provided key examples of innovative and critical investigations that give craft a legitimate position in the formation of new knowledge. This research has helped to articulate philosophies, theories and practices of craft. From the traditional slur that craft is 'dumb' we now are in a position where craft has a voice in the discourse on creative and critical practice. It would seem sensible that our students engage with this context and, with our help, find ways of contributing to it.

Armed with this new confidence we might ask our students, and ourselves, to grapple with the language of a research-based practice. Working from first principles of inquiry – ontology, epistemology, methodology (Guba 1990) - we might ask them to first consider their philosophical position in relation to inquiry: an ontological position, a way of being in the world, what Bolt has boldly termed 'working hot – a materialist ontology' (Bolt 2004); secondly to consider an epistemological position asking 'what is the nature of knowledge in craft?' Dormer suggests that

> "Craft discipline is a body of knowledge with a complex variety of values, and this knowledge is expanded and its values demonstrated and tested, not through language but through practice." (1997 p 219)

Drawing on Carter's 'material thinking' would this give us a position about knowing - a kind of 'material knowing'? Finally, to consider a methodological position – an approach of 'material practice', as part of the spectrum of practice complementing the currently popular 'immaterial practices' discussed in, for example, Bourriaud (2002) and Kester (2004), in which aesthetics are re-cast as 'relational' and 'dialogic'.

However, it is now impossible to ignore the influence of new technologies in craft, so how does this relate to 'material thinking'? Dormer claimed (1997) that 'computer technology now provides craft with its most serious philosophical and practical challenges'. One view of that challenge is to 'decry CAD and rapid prototyping as the anti-haptic enemies of clay' (McDermott 2007/08). A current UK touring exhibition 'Interface' (2006-08)[8] presents work of leading makers who integrate digital processes into their craft practices. The exhibition seeks to demystify how and why makers use the technology by making transparent through images and text their procedures, inspiration and motivating attitudes. Two makers comments are noteworthy: 'The new digital technology will enable forms and surfaces to be achieved that could not be made by any other means' and 'I take to the digital space, a technical and aesthetic understanding of the ceramic material gained through years of involvement and fascination' ('Interface' catalogue p 7). These makers have risen to the challenge and embraced the digital opportunities, importantly from a position of 'advanced material knowledge' gained through traditional making. Introducing students to digital making in the curriculum reveals only a very small number sufficiently inspired to investigate that route in depth, the majority preferring the challenges of traditional craft. What does this tell us?

We also need to know what are the preferred learning styles of our students. Here there is a wealth of research and practice on which to draw (too extensive to discuss here), and it has long been acknowledged that sensory learning styles - visual, auditory, tactile/kinaesthetic - and 'multiple intelligences' (Gardner 1993) must be taken into consideration in the art and design curriculum. Of special importance is the concept of 'constructivist' learning (Bruner 1996) with its three key principles: the first being that learning is constructed as a response to each *individual's experiences and prior knowledge*; the second is that learning occurs through *active exploration*; and the third principle is that learning takes place within a *social context* as a result of *interaction* between learners.

All these considerations have direct implications for the structure, content and delivery of the craft curriculum. If we commit to

adopting/adapting/inventing a 'materialist pedagogy' the following principles and practices might hold:

- Focusing on the 'originary' (Levinas) where **research-led individual projects** allow immersive experiences and possibly new insights – Carter's 'local knowledge' as the 'distinctive yield' of creative research. This also acknowledges the framework of constructivist learning (Bruner) in which the learner's individual experience, prior knowledge, and values give personal narrative a clear role in the making of meaning.
- Focusing on the social interaction of constructivist learning where **collaborative projects** encourage an explicitness about creative intention, a responsiveness to others' experience, expertise and methodologies, and more explicit criteria for evaluating outcomes. Dialogue (or even multi-logues) might generate new expressions of 'material thinking' – specific vocabulary towards developing a language enabling interactive discourse.
- Encouraging a **respectful interaction with materials and tools** that foster a concern for their inherent qualities and capabilities - the 'creative intelligence of materials'. This points to a different relationship with the technical - 'careful and concernful dealings suggests an alternative ethic to mastery' (Bolt).
- Connecting the local to the global in which personal knowledge can be interwoven with 'culture's myth lines, the grand narratives' (Carter) to develop **critical contextual awareness.** In this theory emerges and responds to practice – as Bolt says 'theorizing out of practice not applying theory to practice'. This may lead to 'a mental shift toward craft as a leading edge rather than rearguard' (McCulloch, 2004), and a re-valuing of 'plastic wisdom'.
- **Developing a distinct language of critical craft** that emerges from a deep engagement with practice and through metaphor poetically expresses the specificity of material knowing - 'off-cut thinking', 'discourse as dust', 'working hot' and 'humid'.

Most of these principles and practices in essence are not new - but what is introduced here through a 'materialist pedagogy' for craft is an explicit framework for inquiry – one that is research-led, collaborative, critical, with its own distinct language and discourse that might help extend and amplify the voice and value of craft.

Notes

1 For AHRC's definition of research and funding criteria see www.ahrc.ac.uk

2 To see an image visit: www.gaudiclub.com/ingles/i_vida/fotobras/colonia/1102.jpg

3 To see an image visit: www.sciencemuseum.org.uk/images/I045/10313925.aspx

4 From firsthand knowledge we consider that some of the most interesting thinking and practice currently comes from Australia. Burnett has worked at Monash University on a project called 'Realtime Craft Walkabout' (1999-2000) in which he explored issues of cultural identity through CAD/CAM technology, resulting in a new body of domestic objects. Gray hosted a research visit to RGU by Barrett in July 2007, and is currently working (as the sole international partner) with Barrett and Bolt on new research – 'A critical and comparative evaluation of the value and impact of creative arts research: a national and international investigation'

5 For example, Nancy de Freitas' 'Material Thinking Colloquium', Auckland University of Technology, New Zealand, has now developed into a new on-line journal 'Studies in Material Thinking' www.aut.ac.nz/material_thinking/materialthinking2/index.html ISSN: 1177-6234

6 Acknowledging Kathleen Mary Fallon's lesbian novel 'Working Hot', 1989

7 A more detailed discussion of this is provided in Bolt's 2006 paper '*A Non Standard Deviation: Handlability, Praxical Knowledge and Practice Led Research'*

8 'Interface' touring exhibition of CAD/CAM craft curated by The Devon Guild of Craftsman, at 5 UK venues from 23 September 2006 to March 2008

References

BARRETT, E., 2007. Experiential learning in practice as research: context, method, knowledge. *Journal of Visual Arts Practice*, Vol. 6, Issue 2 (October), ISSN: 14702029

BOLT, B., 2006. *Materializing pedagogies Working Papers in Art and Design* 4. [online] Available from: http://www.herts.ac.uk/artdes/research/papers/wpades/vol4/bbfull.html ISSN: 1466-4917 [Accessed 22 November 2007]

BOLT, B. 2004. *Art Beyond Representation. The Performative Power of the Image*. London and New York: I.B. Tauris.

BOLT, B. 2006. *A Non Standard Deviation: Handlability, Praxical Knowledge and Practice Led Research.* SPIN, *Speculation and Innovation: Applying Practice led Research in the Creative Industries* Conference, Queensland University of Technology, Brisbane, Australia. [online] Available from: http://www.speculation2005.qut.edu.au/papers/Bolt.pdf

BOURRIAUD, N., 2002. *Relational Aesthetics, Les presses du reel.* Trans. Pleasance, S. and Woods, F. (First published in French as *Esthétique relationnelle, Les presses du reel*, 1998).

BRUNER, J., 1996. *The Culture of Education.* Cambridge MA: Harvard University Press.

CARTER, P., 2005. *Material Thinking: the theory and practice of creative research*. Melbourne: Melbourne University Press.

DEWEY, J., 1934. *Art as Experience.* Perigee: New York.

DORMER, P., 1997. *The Culture of Craft.* Manchester University Press.

GARDNER, H., 1993. *Frames of Mind: The Theory of Multiple Intelligences.* New York: Basic Books.

GAUDI, 2002. – *The Search for Form* (catalogue). Museo de Historia de la Ciudad Barcelona, March, 2002.

GUBA, E., 1990. *The Paradigm Dialog.* Newbury Park, California: Sage.

JOHNSON, P., 1995. '*Crafts' magazine*'. July/August pp. 34-37.

KESTER, G., 2004. *Conversation Pieces. Community + Communication in Modern Art.* University of California Press.

MCCULLOCH, M., 1996. *Abstracting Craft: The Practised Digital Hand.* MIT Press.

MCCULLOCH, M., 2004. *Critique of Connectivity Project* http://www.connectivityproject.com

SCHÖN, D., 1983. *The Reflective Practitioner: how professionals think in action.* San Francisco: Basic Books.

WATSON, A., 1992. *An Exploration of The Principle of Chance as a Stimulus to the Creative Activity known as Sculpture*. Unpublished PhD thesis, The Robert Gordon University, UK.

Authors

Carole Gray is an artist, researcher and educator, currently a Research Professor and Director of Research at Gray's School of Art, The Robert Gordon University, Aberdeen. UK. She is co-author of *Visualizing Research: a guide to the research process in Art and Design* (2004), reflecting a longstanding interest in experiential learning in Art and Design education (www.visualizingresearch.info).

Contact details

Prof. Carole Gray, Gray's School of Art, The Robert Gordon University, Garthdee Road, Aberdeen. AB10 7QD Scotland, United Kingdom.

Phone: ++ 00 44 1224 263649
Email: c.gray@rgu.ac.uk
Website: http://www2.rgu.ac.uk/subj/ats/research/staff/gray.html

Gordon Burnett is a master craftsman, researcher and educator, currently Reader in Craft and joint subject leader of Three Dimensional Design at Gray's School of Art, The Robert Gordon University, Aberdeen, UK. In 2004 he initiated a major international conference, *Challenging Craft* (www.challengingcraft.org.uk), and co-ordinated a related on-line collaborative project (www.connectivityproject.com)

Contact details

Gordon Burnett, Gray's School of Art, The Robert Gordon University, Garthdee Road, Aberdeen. AB10 7QD Scotland, United Kingdom.

Phone: ++ 00 44 1224 263691
Email: g.burnett@rgu.ac.uk
Website: http://www2.rgu.ac.uk/subj/ats/research/staff/burnett.html