

DEPICTION AS THEORY AND WRITING BY PRACTICE: THE DESIGN PROCESS OF A WRITTEN THESIS

INTRODUCTION

Most design academics I have met, over my twenty-year career in academia, could readily provide anecdotal accounts of the frustration they and their students feel in trying to reconcile their experience of their design practice and the academic requirements to write. I share those frustrations. During the past 15 - 20 years of my research I have frequently looked for concrete visual examples of techniques that would help reconcile the inclination to work visually with the process of writing, only to be disappointed little existed. The majority of the growing body of published material, on the disjuncture between creative visual practices and writing, are predominantly text-based explications of the 'problem', its history and causes, strategies for resistance, or responses to harness and / or overcome it - sometimes with a few images thrown in for good measure. This literature is emblematic of the crucial yet nascent maturation of the design discipline within the academy and there is much that is good, rebellious, reassuring or instructive contained within it. Although there is still resistance at the fringes there is a consensus emerging that writing is good for creative practitioners.

In this chapter I will firstly cover some of the existing literature concerning this topic then cover some of the techniques I have developed through my own research and practice to help me develop my writing. I should point out that I am not claiming my approach is the only way of tackling this issue. Rather I am offering it as an exemplar that might help others find their own way by adapting what resonates and ignoring what

doesn't. It is also my intention, in providing these exemplars, to articulate the epistemological and ontological consequences of the kind of hybrid approach that emerged through my practice and is indicative of a broader trend in design research. The initial impetus for the work, that I will present, developed through my teaching but gathered momentum upon the commencement of my doctoral studies in 2005. What I discovered through the process is that by being methodical in developing my writing practice - in much the same way I was already methodical in my design practice - producing my thesis (Roxburgh 2013a) became more like an embodied exercise in design than an alien and abstract exercise in writing.

BUT WHY DO WE HAVE TO WRITE WHEN WE JUST WANNA MAKE STUFF?

The literature exploring the vexed relationship between academic writing and creative arts and design practice covers two key areas. There is literature that problematizes the relationship and sees it as a consequence of a lack of student interest or ability versus institutional requirements. Much of this literature either provides evidence of the extent or experience of the problem and / or articulates strategies for overcoming it (Bhagat & O'Neill 2009, Collinson 2005, Edwards 2004, Grow 1994, Hockey 2007, Lyon 2009). Alongside this is literature that seeks to highlight the various personal, cultural, historical or institutional contexts and causes that have lead to the problem arising (Candlin 2000, Elkins 2004, Hockey 2007, Kill 2006, Melles & Lockheart 2012, Wood 1998).

The main theme that emerges throughout the literature is the almost universal frustration, at best, or resistance, at worst, that art and design students feel towards 'academic' writing. The key reason for this is that students who undertake tertiary studies in these fields privilege intuitive thinking and are poorly equipped with the kind of analytical thinking typically required for academic writing (Apps and Mamchur 2009). Although not consistently noted, there is some literature that suggests that this intuitive approach is a consequence of the visual learning styles of art and design students. Collinson notes this kind of learning is both emotional and intuitive (2005: 716-717); Lockheart *et al.* (2004: 97) discuss it in terms of visual-spatial learning styles as does Yee (2012: 471); Irwin calls it aesthetic knowing (2003: 63); McCannon calls it tacit knowledge (2011: 133); and Edwards & Woolf (2007: 55) and Grow (1994) refer to it as visual thinking. Without getting into a detailed discussion of the similarities and differences between the various terms used, in essence what they all have in common is the idea that learning of this sort occurs largely through doing and looking, rather than reading and listening and that visual-spatial learners 'tend to think in pictures rather than words' (Yee 2012: 471). This is known as kinaesthetic learning within the field of constructivist learning theory. It is not surprising then that the vast majority of the available literature that deals with the challenges of teaching creative arts and design students how to write is focused on the explication and efficacy of techniques used to assist such students develop appropriate writing skills.

A common feature of this literature is the success of taking a student centred approach by using their studio practice as the starting point for research and writing, and finding or developing forms of writing that better parallel the creative process (Apps &

Mamchur 2009, Edwards 2004, Kill 2006, Lyon 2009). In addition to this is literature that describes particular exercises or workshops that students undertake to develop the structure and content of their writing (Apps & Mamchur 2009, Edwards 2004, Charlton 2008, Jones 2007, McCannon 2011, Bhagat & O'Neill 2009, Roxburgh & Sweetapple 2007). There are certainly a number of published papers that include examples of experimental or hybrid visual / written texts (Bill 2010, Charlton 2008, Ingham 2012, Leahy 2009, Pollard *et al.* 2009, Speed 2007, Webb 2009, Yee 2012) but more often than not these are final outcomes of the process not examples of the specific techniques that lead to them. There are exceptions (Edwards 2004, Roxburgh & Sweetapple 2007, Yee 2003 & 2012) and these papers include graphics, diagrams, photographs, and / or text based writing task briefs, all of which are concrete examples of techniques used to develop writing skills amongst visual practitioners. However, almost without exception the majority of the available literature relies heavily on narrative description of the techniques used and rarely do actual visual examples appear to any significant extent. Perhaps this in itself is a consequence of the need for researchers to conform to more conventional academic modes of communication in order to be published. Nonetheless it strikes me as paradoxical that the very thing that is being discussed in the literature, the use of visual techniques to help with academic writing, are not very prevalent.

MAPPING THE RESEARCH PROCESS

Hockey (2007: 161-162) notes that there is considerable reluctance, amongst creative art and design students, to systematically document and reflect upon their research and creative processes when conducting higher degree research. Prior to my candidature, I

had been developing the systematic use of mapping techniques to help design students conduct research for design concept and project development as well as to communicate research findings (Roxburgh & Bremner 1999 & 2001). These techniques were further developed - using the work of Buzan and Buzan (2000[1993]) and constructivist learning educators Hyerle (1996) and Sinatra (1990a & b, 2000) - to help design students analyse academic readings and construct written arguments in their theory studies (Roxburgh & Sweetapple 2007). So when I was advised in the early stages of my PhD studies that I needed to 'map my research' and insights, to keep track of it all, the concept of mapping resonated with me. This advice was of course metaphorical and could have as easily been 'make detailed notes' or 'keep good records' but the use of the mapping metaphor encouraged me to use my own studies to further develop the techniques I had been developing with my undergraduate students.

Many design academics are aware of and have used the mind mapping techniques developed by Buzan and Buzan (2000[1993]). Edwards notes that mind maps are popular in design education and typically get used in 'brainstorming' sessions as part of the design process (2004: 124). The purpose of such sessions is to get a large number of interrelated ideas down, in map form, for later reflection and refinement. Buzan and Buzan's work is also a feature of some of the literature concerning techniques to help creative art and design students write (Jones 2007, Lockheart *et al.* 2004, Roxburgh & Sweetapple 2007, Yee 2003). This is perhaps not surprising given the graphic, hands on, and apparently creative nature of this mapping process and its capacity to help with the analysis of ideas through reflection. In addition, their radiant structure facilitates the generation of related ideas in contrast to lists that Buzan and Buzan argue disassociate

‘each idea from its context’ and ‘act in direct opposition to the associative nature of the brain’ (2000[1993]: 86). The Buzan mind mapping approach also seems attractive to help teach creative art and design students the skills of logical argumentation required in academic writing, given that their underlying structure is premised on hierarchy and categorisation. However, Kokotovitch argues the hierarchical structuring of these maps, whilst useful in the design process, proves problematic as they fail to describe the often ‘complex symbiotic relationships between issues’ (2008: 55). Whilst Kokotovitch’s argument is made within the context of their utility in the design process, and I concur with it, I am of the view that they are useful for conventional academic writing, more than other forms of written expression, given its hierarchical structure.

Alternatively both Hyerle (1996) and Sinatra (1990a & b, 2000) have developed various mapping techniques that not only parallel different cognitive processes - stream of consciousness, analytical thinking, hierarchical thinking etc., etc., - but relate to different styles or genres of writing. For example, research report writing, creative composition, argumentative writing, comparative analysis, factual recounts, reviews etc etc. In this regard they provide a wider range of techniques than the very singular approach of Buzan and Buzan. It is for this reason that, in my undergraduate teaching, I drew on all of these approaches, as my primary concern was to get creative art and design students to write in the first place, let alone write an academic essay. However, what Hyerle, Sinatra and Buzan and Buzan share is a fairly prescriptive approach to the use of their various mapping techniques. In my undergraduate teaching I have advocated experimentation with and adaptation of the various methods, rather than adhering to set guidelines, including the use and / or analysis of images in map form

(Roxburgh & Sweetapple 2007). Drawing upon this background then, I constructed 138 maps, during my candidature, which tracked various ideas, references, insights, creative projects and photographic images. In doing this I did not follow any particular technique rigidly, rather I adapted aspects of the techniques I used with my students into the development of my own approach. In addition to creating these maps I also used a variety of mapping techniques to assist me in the drafting of my thesis, and the conception, execution and reflection upon my practice-based research.

My desire not to be prescriptive in how I mapped was instinctive but Kokotovitch's research (2008) indicates that user created, as opposed to the pre-determined structures typical of Buzan mind-mapping, results in more complex relationships between issues emerging, whilst Yin *et al.* (2005) have demonstrated that they better reveal the users knowledge, or misunderstandings, of a topic area and related issues. In this vein Yee, for example, advocates a participatory process in developing literature maps and although she establishes the structural features and contextual links within them they are open to modification by other participants in order to 'provide a more holistic view of the research inquiry' (2003: 8). Like Yin and Kokotovitch, Yee also argues that a less rigid and prescribed approach to mapping is more appropriate in the development of design knowledge (Yee 2012: 471-477). 'Mapping knowledge' Yee argues, 'through images, graphics and diagrams is essentially a way of envisaging information' that is ideally suited for the visual-spatial and intuitive manner in which designers learn and think (2012: 471). The apparent methodological flexibility, some might argue impurity, that these approaches exemplify is typical of research as a form of bricolage that has traction in the design research community. Louridas (1999), in drawing upon the work

of Levi-Strauss, argues that design is a form of bricolage because of the pragmatic, contingent, adaptive and pluralistic nature of its practice. Yee argues that research based upon the concept of bricolage allows researchers to 'deploy available and established strategies and methods' but more significantly 'grant them licence to create new tools and techniques' (2012: 464). Furthermore she argues that the 'multi-perspectival and interdisciplinary characteristics of bricolage lend itself well to the nature of design questions' (Yee 2012: 464).

Louridas notes that the designer, as bricoluer, typically works through and with various forms of diagrams - 'two-dimensional models, free-hand sketches, depictions of relationships, of flows, of structures' - and that such diagrams are *the* object of design that are eventually translated into a 'real world object later on' (1999: 527-528). The mapping and visualisation strategies that I have used in developing my writing, and that is a feature of the relevant literature, parallel these processes. In design practice these visualisations form the basis of the designed object whereas in design writing the visualisations formed the basis of designed writing. The key point that needs to be made here is the manner in which the visual becomes the basis for the development of knowledge, even though words may be a part of the 'data' encompassed into such maps. This points to what Stafford (1997) calls a visual epistemology. The significance of which is not so much that the visual-spatial relationships that can be identified within such maps parallel the manner in which designers often think, nor that their use parallels their use in design practice. The key significance is that it points to design and design thinking being a fundamentally perceptual activity, rather than a problem solving one. I will revisit this issue in more detail a bit later but for now I will turn to an analysis of

the specific techniques I developed through my research, all of which use some form of mapping.

RECURSIVE WRITING

I have always preferred to learn through doing and looking. Reading academic texts and writing analytically, in essay form, has been a struggle for me. I have a hopeless recall of the content of academic texts that in turn makes it difficult to write about them. It wasn't until 2000, when I came across Gardner's (1983) concept of multiple intelligences - that includes bodily-kinaesthetic intelligence - and Kolb's (1984) learning style theory - that defines learning through feeling and doing as accommodating - that I understood that I had a preference for kinaesthetic learning. Given the scale of reading and writing that lay before me at the outset of my PhD, and knowing how poor my recall of academic texts was, I developed a somewhat convoluted strategy of note taking that was quite tactile and embodied. Over a period of twelve months I developed and refined this process, that I now call recursive writing. Recursion is a process of repeating things in a self-similar manner, usually ad-infinitum. In the context of my research what this meant was that I manually wrote much of what I read, or my reflections upon it, in longhand form then subsequently reworked my notes through a number of somewhat reductive iterations (Figure 1). As slow as this was, I found that longhand helped my recall of what I read because I had the sense of 'doing' writing. This is not entirely unusual and there is some evidence that creative practitioners find that the tactile quality of making notes by hand reinforces the idea that handwriting is 'a form of visual expression' (Preston & Thomassen 2010: 49). I

deliberately avoided word-processing my initial notes, as this did not entail the same tactile experience as handwriting did. Nor did I use a pen scanner to record relevant quotes, as some of my peers were doing, for the same reason.

FIGURE 1 HERE

Initially my notes involved the paraphrasing or transcription of key themes in the literature relevant to my work. The almost rote learning that this largely mechanical approach entailed was not unlike what I have previously called the 'mimicry of action' which 'can be equated to ones technical virtuosity in being able to mimic pre-existing styles'. (Roxburgh & Bremner 2001: 67). Such mimicry is typical in the learning of novice designers and can be seen as an embodied way of learning how a variety of structural and stylistic aspects of a design do or do not work together. In the context of being a novice writer there are strong parallels to the structural and stylistic aspects of language that also can be understood through such mimicry. To make these notes more accessible for the word processing that writing my thesis would entail, I re-transcribed them into one single word processing document that would house my entire literature review (Figure 1). Again, this reinforced my understanding of the material. Much of this material existed in a state of 'raw data' not unlike that collected by novice design researchers in that there wasn't much evidence of my own critical thinking or insight. It was through a further stage of recursion, which entailed printing out each literature review and mapping it into an A2 sketch-pad, that deeper insight into the material occurred.

FIGURE 2 HERE

In mapping the literature reviews I re-read them and highlighted key ideas, questions and insights, through a Schon-like reflective conversation in action (Figure 2). In many respects this last technique is a bit like mind mapping but rather than mapping a series of interrelated key ideas drawn from an ill-defined and abstract (or wicked) design problem or situation, I was mapping ideas contained within the actual literature review and connecting it back to something quite concrete - the original article - even if the ideas explored were highly abstract. Spatial and contextual relationships between ideas within a paper began to emerge and as more reviews were processed in this way, across a body of papers. The very tactile and visual process this mapping involved made it feel like I was committing key ideas and insights to a sort of 'muscle memory'. Producing these maps, as concrete manifestations of abstract ideas, appealed to me as it paralleled my experience of designing, moving from the concrete to the abstract and back again.

My approach to mapping the literature is somewhat at odds with that advocated by Yee who recommends starting with a clearly defined topic list, and the further classification of related topics under subject headings, as a starting point in structuring literature maps and hence the literature search (2003: 7). One might call this a top down approach in that the structure and topics guide the research. I was less clear about the topics that were relevant to my research and instead allowed my reading, and the insights I gained from it, to guide the development of the topics, as they emerged through my research, and the development of my literature maps. Such a bottom up approach is not unlike that taken by grounded theorists. Grounded theory was developed by constructivist

social researchers and entails collecting and analyzing and interpreting 'data to build middle-range theoretical frameworks' in order to 'focus further data collection' that in turn informs and refines the theoretical analysis (Charmaz 2003: 249-250). It is generally assumed that grounded theory privileges inductive reasoning but Bryant and Charmaz (2007: 44-46) and Reichertz (2007: 214-228) demonstrate that abduction plays a more significant role than induction.

Irrespective of the starting point of top down or bottom up literature mapping, what these approaches have in common is: the refinement of the research topics through a reflective process of analysis and the consequential development of new insights; the spatial - as opposed to hierarchical - organisation of ideas; and an understanding that these ideas are 'neither fixed nor definitive' but are signposts that enable the researcher 'to navigate through mass amounts of ideas, concepts and methodologies encountered in the literature' (Yee 2003: 8). The reflective and indeterminate nature of both these approaches signal abductive inquiries and point to research as a form of bricolage. Abductive reasoning is privileged by designers, as is discussed in the relevant literature (Cross 2011, Kolko 2011, Lawson 2006[1980], Louridas 1999). The use of various forms of mapping in design research therefor should be of no surprise to us given the parallels between the manner in which mapping helps generate knowledge abductively, and the abductive manner in which designers work.

The hand written and typed notes, as well as the A2 literature maps, that I developed through my research can be seen as a form of diary that existed in 3 cross-referenced forms. Preston and Thomassen note 'journals, sketchbooks and workbooks, all

variations of the diary, figure prominently in art and design studies as the repository of emerging ideas and forms' (2010: 49). They argue that for art and design diaries to be rigorous reflections of the research material, coding the data and categorizing it in relation to other material or experiences is essential (Preston & Thomassen 2010: 49). Charmaz notes that memo writing, a form of reflective diary, is a key tool in the grounded theorists kit and that it 'helps to spark our thinking and encourages us to look at our data and codes in new ways' (2003: 261). Furthermore, and perhaps more importantly, she argues that 'through memo writing, we elaborate processes, assumptions and actions that are subsumed under our codes' (Charmaz 2003: 261).

FIGURE 3 HERE

The rigorous use of coding is both a pragmatic device essential to navigate through data and find ideas within the large volume of material, contained in both note and map form, and a framing device that reflects and shapes the theoretical construct of the research. For pragmatic purposes I developed several basic coding techniques through each note taking iteration and the eventual literature mapping that included: recording what page and paragraph an idea or quotation came from; and differentiating between quotations, the transcription of the ideas in the literature, and my own reflections upon them by underlining, highlighting or changing the case of the text (Figure 3). When it came to coding the emergent concepts in the research I mapped the typed notes and extracted key ideas or insights (Figure 2). These key concepts were eventually re-mapped in what I call meta-maps (Figure 13) that I will discuss shortly. Each of the three forms that my literature review existed in was cross-referenced enabling me to move between a macro

and complex overview (the original article or chapter) right down to a micro and reductive focus on very specific points (my maps of the literature review) (Figure 1). Because of the simple coding strategy I used I could locate an idea quickly within a map and trace it right back to the original paper via my notes. In addition I was able to clearly delineate between an author's ideas and words (crucial for correct attribution), my interpretation of that, and the ideas I had developed myself. Furthermore, by the time it came to writing my draft thesis I had a literature review of some 80,000 words contained in a single text searchable document. This meant that many of the ideas I was exploring, the references I was making, and insights that I had, were already written in draft form. Writing the thesis involved a lot more editing and some rewriting rather than starting entirely from scratch.

Aside from the obvious benefits and pragmatics derived from coding the research material generated, in map or diary form, these approaches have profound epistemological consequences. For Preston and Thomassen (2010) and Yee (2012) such coding and rigour are the basis for the generation, and significantly, the explication of design knowledge. Through the reflective process of developing and refining the codes we ascribe to our 'data' we are building a kind of picture of the state of knowledge, as we perceive it to exist, at that moment. By definition then, this means we perceive any gaps in knowledge that might exist as it relates to our inquiry. This is the epistemological consequence. As Charmaz indicates the reflective use of memos in grounded theory reveals assumptions we have about the nature of knowledge, and indeed reality (Charmaz 2003: 261). The assumptions we have about reality are a direct consequence of perceiving the state of knowledge, as it exists, including the gaps that

we perceive in that. By then addressing this knowledge gap we develop new knowledge and consequently change the world in some small way, be it theoretically or materially. This is the ontological consequence. Because, as designers, we often map and interpret our research data in some kind of visual form we in effect transform reality through the visual. As design knowledge so often gets used for designing things, and not just arriving at theoretical insight, then we actively transform the material dimension of our reality. Again this points to design as a perceptual activity as opposed to a problem solving activity. And once again I will defer a discussion about this until later.

DIAGRAMMATIC INTERPRETATION AND DEVELOPMENT OF CONCEPTS

It struck me early in my candidature that the conversations I was having about my research with my supervisors, at conferences, or with students were as instrumental in shaping my thinking as the reading I was engaged in. With that in mind I made rough maps, during these conversations, of the key ideas discussed and their relationships (Figure 4). These were then re-mapped into an A2 sketch-pad with further insights and reflections inscribed. Like my literature review maps these conversational maps were highly reductive but were a useful tool in facilitating my recall of the more complex ideas that emerged as well as actively constituting my growing knowledge of relevant material. Once again what was useful in doing this was that it gave a seemingly concrete, visual dimension to often complex and abstract ideas that unfolded through time and space via conversation. During the conversations with my supervisor we would often pass a piece of paper backwards and forwards and roughly sketch diagrams

of very specific concepts to clarify our understanding of them (Figure 5). We were metaphorically trying to be on the same page whilst literally working on it. Designers typically use reflection in action as a kind of conversation with a design situation that draws upon the designer's experiential knowledge (Schon 1992) and, in a similar, manner grounded theorists use the reflective process of memo writing to encompass an understanding of the role of their subjectivity in the construction of knowledge (Charmaz 2003). As Yee demonstrates, both in her own work (Yee 2003) and numerous case studies (Yee 2012) the advantages of involving others in such reflective processes is to provide a shared understanding and more holistic overview of the material and encompass the interdisciplinary knowledge typically required in design research.

FIGURE 4 HERE

FIGURE 5 HERE

Where the tone of my supervisory interactions was conversational, much of the literature I was reading took on a more argumentative tone. Sometimes these arguments were so complex that I had to extend beyond my normal techniques of mapping and craft some of the key points I identified into a more diagrammatic form. This resulted in very structured diagrams of key concepts sitting alongside the mind-maps of the broader context these concepts sat within (Figure 6). This enabled me to more clearly see the relationships between the bits of the argument than a mind-map would allow me. Like my approach to mapping the literature, this approach to mapping conversations and arguments, and diagramming concepts enabled me to zoom in from a macro perspective down to a micro perspective and back again, all through a process that engaged some

form of embodied interpretation and making. Preston and Thomassen's (2010: 51) review of the mind-mapping literature talks about them as being a form of diagram. However, whilst I concur with this as a generalisation, I am using the term diagram in the context of my work to refer to drawing simple diagrams of sets of relationships contained in very specific concepts exclusive of the broader context they sit within. Maps on the other hand I see as locating these concepts within these broader contexts.

FIGURE 6 HERE

Diagrams, Louridas (1999) argues, offer distinct advantages to designers 'both in terms of information content and in terms of cognitive properties' (1999: 528). In relation to information diagrams provide a simplified picture of rich and complex information and in terms of their cognitive properties 'diagrams facilitate search and inference and allow lateral transformations without a premature freezing of concepts' (1999: 528). Preston and Thomassen argue 'diagrams are known for their ability to order complex scenarios with an abstract and graphic clarity capable of conveying the essential nature of the subject at hand' (2010: 51). In this phase of my work I crafted complex concepts into various diagrams until I felt I had such clarity about the essential features of a particular concept irrespective of the broader argument it was embedded within (Figure 7). This in turn facilitated my understanding of those broader arguments. As a consequence of this experience I began to create diagrams of key concepts I was developing about, and through, my own research (Figure 8). In this regard it did not feel like I was writing theory, rather I felt like I was designing it. As a way of extending this approach to research, and to further refine my clarity about my research topic and its key concepts, I

designed a predominantly diagrammatic, or visual, essay that functioned like a synopsis of these concepts (Roxburgh 2010). I say this because once again I was learning through designing, visualizing and crafting these concepts into pictorial form. The key ideas that emerged through this became the framework for much of my eventual thesis and were some of the main points I wrote about in it.

FIGURE 7 HERE

FIGURE 8 HERE

MAKING PICTURES TO EXPLORE ARGUMENTS AND CONCEPTS

My PhD was undertaken at the outset with the clear intention that my creative practice, photography, would play a key role in how I conducted my research. In this regard it conformed to the now well-established methodology of practice-based research. My research was critiquing prevailing attitudes towards, and assumptions about, the use of photo-observation in design research through my own photographic practice (Roxburgh 2013a). It was neither purposeful in the sense that it was addressing a specific design 'problem', or focusing on a group of users' 'needs'. My particular interest was in challenging the photographic orthodoxy of realism in the pursuit of design knowledge, and the production of the designed world, through an exploration of abstract photography. As such it could be characterized as a form of critical design practice for it was using a practice, and its artefacts, to interrogate and critique prevailing norms (Dunne & Raby 2001). To that end I used my practice to ask questions similar to those I was asking through my review of the literature.

With this in mind I engaged my practice quite early on in my studies. Although I had no clear idea what those questions were going to be I knew that by working intuitively, and trusting that, they would eventually become apparent - again something of a grounded theory or bricoluer approach. It was also a relief and an escape to disappear into my practice without too structured or analytic an approach when analysis was the main basis upon which I was conducting my reading. This is hardly surprising and conforms to the experience of creative art and design research students as noted by Hockey (2007: 163). Inevitably the ideas that emerged through my reading and its mapping began to emerge in the kinds of photographs I was taking and the kinds of questions I was asking of and through my photographs. This experience of my practice in turn began to inform not only the material I was reading, but also how I was interpreting that material and the questions I was asking of it. Once again I used mapping to document the various photographic exercises I was engaged in. Sometimes these consisted of nothing more than a series of photographs I had taken, stuck in my A2 sketch-pad in between A2 pages that mapped my readings (Figure 9). At other times these maps were reflective of the ideas I was exploring, not only in my photography but also in what I was reading and writing. This form of mapping revealed connections to me between theories in the literature and theories emerging through my practice, connections not apparent to me in any other form. Insight was revealed through the reflection in action this approach to mapping entailed.

FIGURE 9 HERE

After several years of working in this manner, in which my research topic had become substantially clearer, I began to set myself a series of quite specific photographic project briefs (Figure 10). These briefs enabled me to interrogate my creative work through a series of public, and in one case participatory, exhibitions (Figure 11). Once again the process of mapping was used to document this process but also to explore fresh relationships and insights between my photographs, what I was reading and writing, and the feedback I received from participants and audiences of these shows. What I discovered through this stage of my work was that, up to a point, the more removed from realist depiction a photograph became the greater the interpretive and imaginative space of the viewer became in responding to it. Beyond a certain point of abstraction, however, the photograph became something in and of itself and the space of imagination and interpretation began to close down as the photograph became less obviously connected to the perceived world. In essence my work was dealing the relationship between the abstract and the concrete, two ideas central to design.

FIGURE 10 HERE

FIGURE 11 HERE

My practice-based work culminated in an exhibition that chronicled my entire research process and creative and written output prior to completing my first thesis draft (Figure 12). I used the logic of mapping as the basis for the exhibition design in that the work was curated and installed in such a way that it led the viewer through the various stages and outputs of my research process. The timing of this exhibition with the writing stage I was at was largely coincidental but the experience was revelatory. I say this because it

was the first time I could see all of my work in one location and trace all of the key ideas and moments of insight through it. In essence I had designed an exhibition of my ‘thesis’ and the research journey that got me there and this informed the very basis of the structure and content of my thesis.

FIGURE 12 HERE

THE DESIGN OF A WRITTEN THESIS

From my final exhibition I had a strong sense of not only designing the conceptual structure of my argument but it felt like I had an embodied experience of it because I had to make and install the exhibition. This sense flowed into the manner in which I was ‘writing’ my thesis. As I outlined earlier I had a literature review of about 80,000 words towards the end of my studies. In addition, along the way, I had written several conference papers, journal articles and book chapters about my research. All of this work had been developed through the techniques I have already outlined so writing the thesis was much more a case of reshaping, or editing, parts of that material. So arriving at the base of the mountain that writing a draft PhD thesis appears to be (my final thesis clocked in at about 75000 words) was not as daunting as it might otherwise have been for I had been meticulous and methodical in my preparation. Furthermore I had done so through a variety of designerly methods, as well as through my own creative practice, and consequently I felt like I was a part of the work, or it was part of me. This feeling of belonging didn’t happen overnight but was the result of an ongoing process of making, thinking, reading, writing and reflection.

In order to keep an overview of the vast amount of information, both visual and written, that I had generated throughout my studies I made sure that at semi-regular intervals I reviewed the contents of all my maps to date and remapped the key concepts, references, ideas, creative work etc., that appeared in them. These maps were meta-maps (Figure 13). This allowed me to better see and evaluate how my ideas had developed as well as what the key ideas were and the relationships between them. As outlined previously Yee (2003) generated literature maps to overview and guide her research. In this instance I was using my research to generate overview maps that in turn guided my research. Despite the apparent differences between these approaches both demonstrate the kind of abductive and reflective reasoning typical of design research and practice that help the designer, or design researcher, determine an appropriate course of action with the contingencies of the circumstances in which they work (Louridas 1999: 531-534). As such my meta-mapping provided me with an overview of my research in a way that enabled me to burrow into the specifics of the material I had created if and when I needed to but specifically helped me to shape the structure of the thesis and its contents.

FIGURE 13

When it came to the actual task of writing the draft thesis I again used a kind of mapping, as I had done with the various papers I had created throughout my studies. The technique I used was a bit like the cut-up techniques the Dadaists used to write poetry. Using my meta-maps I identified the relevant sections of my literature review,

and the original sources they related to, as well as the relevant points in my publications that related to the specific concepts each section of the thesis was dealing with. I printed out the sections of this material I had identified, cut them up and physically arranged the bits into the structure that I had envisaged for them (Figure 14). This process was very dynamic so the various bits of paper could not be stuck down in case I needed to move a section around. As a result I did this on a dedicated pin-board in my office.

FIGURE 14 HERE

This process paralleled the manner in which I work as a designer and although I was working with a large amount of written material I was in a sense looking at the relationship between content and structure and doing a lot of cutting and pasting. By working with what I called 'essay walls' I could easily locate particular sections of a chapter and consider them in relation to other sections within that chapter but also within the overall thesis. If I was unhappy with the juxtaposition of one section against another I knew I either had to move it, delete it, re-write it, or write a proper segue between them. This didn't just involve reading but was very much based upon an embodied sense of observation as well a very physical approach to editing. It is a process that reminds me a lot of the manner in which art directors, such as Alexy Brodovitch, work with scale mock-ups of the magazines they are designing to see how they work as a whole. In more contemporary design practices, such as interaction design and human computer interface design, designers commonly use what Yuille calls forensic walls to 'develop assemblages of their design research, thinking and production' (2012: 134). Such walls 'become materials to think with, think through,

and perform what it is that researchers are thinking about' (Nafus & Anderson 2009: 137). Not only are they used to produce designed artefacts but they produce social relations through what Nafus and Anderson regard as a form of writing that involves a 'process of moving between text, visual materiality, and orality' (Nafus and Anderson 2009: 137).

Although the essay walls that I used to craft my final thesis were largely text based the underlying logic of the forensic wall was at play within them, as it was when I was developing my work for exhibition. The 138 A2 maps that I produced throughout my research more closely resembled Youille's forensic walls but for the sake of practicality I had to keep these reasonably compact. Notwithstanding this my maps, diagrams, and essay walls were all a 'stage for designerly conversation' that allowed me 'to manage ambiguity while designing' (Youille 2012: 137). As importantly these techniques also enabled me to manage ambiguity while writing.

KNOWLEDGE OF THINGS AND THINGS OF KNOWLEDGE

I stated at the outset of this chapter that there was a growing body of literature that discussed the issues of writing, and specifically academic writing, for creative art and design students in the university sector. In this regard much of what I have described in this chapter may be familiar to those involved in it. However, it has been my experience that little of this research presents much in the way of the very visual and designerly techniques used to facilitate such writing. This presents a paradox for those seeking exemplars of such techniques for what they find is predominantly written accounts of

those techniques that potentially perpetuate the very issue they seek to address; getting visual thinkers, or kinaesthetic learners, to engage in some level of analytical reading and writing. It is partly with this in mind that I have produced this chapter to provide a few more exemplars of what these, or at least my, techniques look like. In doing so I am not making the claim that these techniques are definitive, nor will their use produce similar results for others, for they are not like the steps in a controlled scientific lab experiment. Unlike lab experiments, design diaries - or in this case maps - do not lead to 'verifiable research outputs' rather they are 'forms of media' that construct a reality in order to evaluate that reality (Preston & Thomassen 2010: 51). To that I would add that the approaches to visualizing design research that I have covered, and is discussed in the literature I have mentioned, do not simply evaluate reality but inevitably result in some form of conceptual and material transformation of reality. These processes are the explicit evidence of the world-making dimension of design, to use Goodman's term (1978). This brings me back to a point I have deferred addressing twice within this chapter and that is my contention that design is not simply a problem solving or even problem setting activity. It is my contention that the problem-solving paradigm of design is simply a frame that we use to better understand and, more importantly from the instrumentalist perspective, manage design.

It is generally acknowledged in the design thinking / problem solving literature that the visual representation of complex information in a variety of forms is a central feature of design activity (Cross 2011, Kolko 2011, Lawson 2006[1980], Louridas 1999, Schon 1992, Simon 1969... the list goes on). In a phenomenological sense the concept of the visible image as a mere representation of reality does not accord with the significant

role it plays in our embodied perception of the world. As Merleau-Ponty (1964) argues the visible image is not simply a copy, or representation, of the world, nor separate to our embodied perception of it. Perception, in a classical sense sees 'our relation to the world' as 'that of a thinker to an object of thought' (Merleau-Ponty 1964: 12), hence classically speaking we can see the visible image as a representational object separate to the reality it purports to represent. However, Merleau-Ponty contends that as a perceived thing can exist 'only in so far as someone can perceive it' its existence is contingent entirely upon our perception (Merleau-Ponty 1964: 16). As a consequence any perceived thing, be it a visible image of a material object or the material object itself, is not a stable entity but is transformed as the circumstances of our perception change. As the image in this understanding constitutes a part of our sense of reality, and is a part of the horizon upon which we perceive reality, then each visible image we create also transforms reality (Merleau-Ponty 1964). Merleau-Ponty calls this the 'image sensitising itself' (2010: 153).

This is the ontological consequence of thinking through the image. Interestingly Schon himself recognizes as much for he argued that not only do designers 'construct the meanings of their situations, materials and messages, but also the ontologies on which these meanings depend' (1992: 9).

Perception, Merleau-Ponty argues, does not reveal truths but presences. Our ability to constitute 'the unity of perceived objects' from the revelation of its various presences is what he calls 'perceptual synthesis' (Merleau-Ponty 1964: 16). It is for this reason that I argue that the dependence of design upon the transformation of the world through the

visible image, in whatever form that may take, is fundamentally a perceptual activity. Furthermore I would argue, as I have done in more detail elsewhere (Roxburgh 2013a and Roxburgh 2013b) the only inevitability arising from this is the ongoing imaginative transformation of the world. Conceptually and materially speaking this is what I was doing through my research. On a conceptual level I was constructing an understanding of design and its relationship to reality, whilst transforming that reality, through the material production of my maps. In conventional research terms I made knowledge of things and in design terms I made things of knowledge.

BIBLIOGRAPHY

Apps, L. and Mamchur, C. (2009) 'Artful Language: Academic Writing for the Art Student', *The International Journal of Art and Design Education*, 28, 3: 269-278.

Bhagat, D. and O'Neill, P. (2009) 'Writing Design: A Collaboration Between the Write Now CETL and the Sir John Cass Department of Art, Media and Design', *Art, Design and Communication in Higher Education*, 8, 2: 177-182.

Bill, A. (2010) 'Just Another Piece of Paper: Creative Research and Writing', *Journal of Writing in Creative Practice*, 3, 1: 5-15.

Bryant, A. and Charmaz, K. (2007) 'Grounded Theory in Historical Perspective: An Epistemological Account', in A. Bryant and K. Charmaz (eds.) *The Sage Handbook of grounded Theory*, London: Sage Publications: 31-57

Buzan, T. and Buzan, B. (2000[1994]) *The Mind Map Book*, London: BBC Worldwide Limited.

Candlin, F. (2000) 'Practice-based Doctorates and Questions of Academic Legitimacy', *International Journal of Art and Design Education*, 19, 1: 96-101.

Charlton, J. (2008) 'Behind the Lines and Lines and Lines: Student Studio Solutions to Projects that Facilitate the Exploration of Visual and Textual Languages Within Fine Arts Practice', *Journal of Writing in Creative Practice*, 1, 3: 237-259.

Charmaz, K. (2003) 'Grounded Theory: Objectivist and Constructivist Methods', in N.K. Denzin and Y.S. Lincoln (eds.) *Strategies of Qualitative Inquiry*, London: Sage Publications.

Collinson, J. A. (2005) 'Artistry and Analysis: Student Experiences of UK Practice-based Doctorates in Art and Design', *International Journal of Qualitative Studies in Education*, 18, 6: 713-728.

Dunne, A. and Raby, F. (2001) *Design Noir: The Secret Life of Electronic Objects*, London, Basel: Autumn Media, Birkhasuer.

Edwards, H. (2004) 'Art and Design Students Employing Aspects of the Visual and Metaphoric to Structure and Create Meaning in Writing', *Art Design and*

Communication in Higher Education, 3, 2: 119-136.

Edwards, H. and Woolf, N. (2007) 'Design Research by Practice: Modes of Writing in a Recent PhD from the RCA,' *Journal of Writing in Creative Practice*, 1, 1: 53-67.

Elkins, J. (2004) 'Theoretical Remarks on Combined Creative and Scholarly PhD Degrees in the Visual Arts', *Journal of Aesthetic Education*, 38, 4: 22-31.

Gardner, H. (1983) *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.

Goodman, N. (1978) *Ways of Worldmaking*. Hassocks: Harvester Press

Grow, G. (1994) 'The Writing Problems of Visual Thinkers', *Visible Language*, 28, 2: 1134-161.

Hockey, J. (2007) 'United Kingdom Art and Design Practice-Based PhDs: Evidence from Students and Their Supervisors', *Studies in Art Education*, 48, 2: 155-171.

Hyerle, D. (1996) *Visual Tools for Constructing Knowledge*, Alexandria, VA: Association for Supervision and Curriculum Development.

Ingham, M. (2012) 'From Wish You Were Here? to GAMSWEN and onto Designed Dissertations: Connecting the Design Studio with Writing in Design', *Journal of Writing*

in Creative Practice, 5, 2: 301-318.

Irwin, R. (2003) 'Toward an Aesthetic of Unfolding In/Sights Through Curriculum', *Journal of the Canadian Association of Curriculum Studies*, 1, 2: 63-78.

Jones, H. (2007) 'Bisociation Within Keyword-mapping: An Aid to Writing Purposefully in Design', *Journal of Writing in Creative Practice*, 1, 1: 19-31.

Kill, R. (2006) 'Coming in From the Cold: Imperialist Legacies and Tactical Criticalities', *The International Journal of Art and Design Education*, 25, 3: 308-317.

Kolb, D.A. (1984) *Experiential Learning: Experience as the Source of Learning and Development*. New Jersey: Prentice Hall.

Kolko, J. (2011) *Exposing the Magic of Design: A Practitioner's Guide to the Methods and Theory of Synthesis*. Oxford: Oxford University Press.

Lawson, B. (2006[1980]) *How Designers Think: The Design Process Demystified*. Oxford: Architectural Press.

Leahy, M. (2009) 'Glossing Speakers, or Bookmaking for Amateurs', *Journal of Writing in Creative Practice*, 2, 1: 55-67.

Lockheart, J. *et al.* (2004) 'Writing Purposefully in Art and Design (Writing PAD)', *Art*

Design and Communication in Higher Education, 3, 2: 89-102.

Louridas, P. (1999) 'Design as Bricolage: Anthropology Meets Design Thinking',
Design Studies, 20, 6: 517-535.

Lyon, P. (2009) 'Writing About Design Pedagogy and Designing Pedagogical Writing',
Art Design and Communication in Higher Education, 8, 2: 151-156.

McCannon, D. (2011) 'Towards the Hybrid Essay: The Visual Essay Project', *Journal of Writing in Creative Practice*, 4, 2: 131-140.

Melles, G. and Lockheart, J. (2012) 'Writing Purposefully in Art and Design:
Responding to Converging and Diverging New Academic Literacies', *Arts and Humanities in Higher Education*, 11, 4: 1-17.

Merleau-Ponty, M. (1964) *The Primacy Of Perception, And Other Essays On Phenomenological Psychology, The Philosophy Of Art, History, And Politics*, Evanston: Northwestern University Press.

Merleau-Ponty, M. (2010) *Institution in Personal and Public History and The Problem of Passivity: Sleep, the Unconscious, Memory. Course Notes at the Collège de France (1954-55)*. Trans. Leonard Lawlor and Heath Massey, Evanston: Northwestern University Press.

Nafus, D. and Anderson, K. (2009) 'Writing on Walls: The Materiality of Social Memory in Corporate Research', in M. Cefkin [ed.] *Ethnography and the Corporate Encounter: Reflections on Research in and of Corporations*. New York, Oxford: Berghahn Books: 137-157.

Pollard, A. *et al.* (2009) 'Hampstead Revisited', *Journal of Writing in Creative Practice*, 2, 3: 301-325.

Preston, J. and Thomassen, A. (2010) 'Writing Through Design, an Active Practice', *Journal of Writing in Creative Practice*, 3, 1: 45-62.

Reichert, J. (2007) 'Abduction: The Logic of Discovery of Grounded Theory', in A. Bryant and K. Charmaz (eds.) *The Sage Handbook of grounded Theory*, London: Sage Publications.

Roxburgh, M. and Bremner, C. (1999) 'The News From Nowhere', *Useful and Critical: The Position of Research in Design* (conference proceedings), Helsinki: University of Art and Design.

Roxburgh, M. and Bremner, C. (2001) 'Redoing Design: Comparing Anecdotes About Design', *International Journal of Art and Design Education*, 20, 1: 65-74.

Roxburgh, M. and Sweetapple, K. (2007) 'The Cartography of Theory and Practice', (CD Rom) *Conference Proceedings of ConnectEd: International Design Education*,

Sydney: University of New South Wales.

Roxburgh, M (2010) 'Design and the Aesthetics of Research', *Visual Communication*, 9, 4: 423-439

Roxburgh, M. (2013a) *The Crisis of the Artificial: Why Does Everything Look the Same?*, PhD dissertation, Canberra: University of Canberra. Available <http://www.canberra.edu.au/researchrepository/items/a7bafbe2-a2ae-1e77-2570-fbdb1b17e66d/1/>

Roxburgh, M (2013b) 'The Images of the Artificial or Why Everything Looks the Same', *The International Journal of the Image*, 3, 3: 1-16

Schon, D.A. (1992) 'Designing as Reflective Conversation With The Materials of a Design Situation', *Knowledge Based Systems*, 5, 1: 3-14

Simon, H. (1969) *The Sciences of the Artificial*, Cambridge (Ma): MIT Press.

Sinatra, R. *et al.* (1990a) 'Content Area Cognitive Mapping for Reading and Writing Proficiency', *Journal of Reading*, 33, 6: 424-432.

Sinatra, R. *et al.* (1990b) 'Combining Visual Literacy, Text Understanding, and Writing for Culturally Diverse Students', *Journal of Reading*, 33, 8: 612-617.

- Sinatra, R. (2000) 'Teaching Learners to Think, Read, and Write More Effectively in Content Subjects', *The Clearing House*, 73, 5: 266-273.
- Speed, C. (2007) 'Will Web 2.0 Add 'Purpose' to Writing by Artists and Designers?', *Journal of Writing in Creative Practice*, 1, 1: 77-83.
- Stafford, B. M. (1997) *Good Looking: Essays on the Virtue of Images*, Cambridge (Ma) and London: MIT Press.
- Webb, J. (2009) 'The Book Objects: Writing and Performance', *Journal of Writing in Creative Practice*, 2, 1: 27-44.
- Wood, J. (1998) 'The Culture of Academic Rigour: Does Design Research Really Need It?', *The Design Journal*, 3, 1: 44-57.
- Yee, J. (2003) 'Dynamic Literature Mapping: Typography In Screen-Based Media', *European Academy of Design Conference*, Barcelona: European Academy of Design.
Available <http://www.ub.edu/5ead/PDF/8/Yee.pdf>
- Yee, J. (2012) 'Implications for research training and examination for design PhDs', in R. Andrews. *et al. The SAGE Handbook of Digital Dissertations and Theses*, London: SAGE Publications: 461-492.
- Yin, Y. *et al.* (2005) 'Comparison of Two Concept-Mapping Techniques: Implications

for Scoring, Interpretation, and Use', *Journal of Research in Science Teaching*, 42, 2:
166-184.

Youille, J. (2012) *The Forensic Wall: How Ambiguity and Affinity are Enacted to Perform Interaction Design*, Phd Thesis, Melbourne: RMIT. Available
<http://researchbank.rmit.edu.au/view/rmit:160259>