Practice-led Research, Research-led Practice in the Creative Arts

Edited by Hazel Smith
and Roger T. Dean

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Hazel Smith and Roger T. Dean

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CHAPTER I

Introduction: Practice-led Research, Research-led Practice – Towards the Iterative Cyclic Web

Hazel Smith and Roger T. Dean

This book addresses an issue of vital importance to contemporary practitioners in the creative arts: the role and significance of creative work within the university environment and its relationship to research practices. The turn to creative practice is one of the most exciting and revolutionary developments to occur in the university within the last two decades and is currently accelerating in influence. It is bringing with it dynamic new ways of thinking about research and new methodologies for conducting it, a raised awareness of the different kinds of knowledge that creative practice can convey and an illuminating body of information about the creative process. As higher education become more accepting of creative work and its existing and potential relationships to research, we also see changes in the formation of university departments, in the way conferences are conducted, and in styles of academic writing and modes of evaluation.

We wish to suggest that there are many rich and innovative ways in which creative practice can constitute, or contribute to, research in the university environment. But we are also committed to the reciprocal relationship between research and creative practice. So as well as considering how creative practice can revolutionise academic research, we wish to ponder how academic research can impact positively on creative practice: this bi-directional focus is evident in the title of our book, practice-led research, research-led practice. Together with our contributors, we unpick the issues arising out of creative practice across different disciplines; we document, conceptualise, analyse and debate the proliferating relationships between creative work and research; we look at the histories of those relationships and tease open the political difficulties and opportunities within the higher education environment that the conjunctions between research and creative practice generate. In addition, we discuss the relevance of these questions as part of broader issues such as: what is knowledge, what is research and how can we understand the creative process?

Creative work within the university environment is now often referred to as practice-led research, practice-based research, creative research or practice as research. The terminologies are a means to characterise the way in which practice can result in research insights, such as those that arise out of making a creative work and/or in the documentation and theorisation of that work. Several of our authors suggest that practice-led research can develop unique processes for creative work and for research. But this book will also explore the reverse idea – an idea already possible and operative within practice-led research discourse but often not forcefully pursued – that academic research can lead to creative practice. We do not see practice-led research and research-led practice as separate processes, but as interwoven in an iterative cyclic web, a model we develop later in the chapter.

In this introduction we set some of the groundwork for the book: we consider the concepts of research and knowledge; introduce the terms practice-led research and research-led practice and the issues they throw up about the relationship between creative work and research; explain our objectives in developing the book; outline the processes in our own theory and practice to date; give the results of a survey we conducted of researcher/practitioners; put forward our model for the interaction of creative practice and research; discuss some of the political issues both within the university and the wider community; and summarise the arguments of the contributors.

THE CONUNDRUM OF KNOWLEDGE AND RESEARCH

In the humanities, theory, criticism and historical investigation have been heavily prioritised over arts practice. Traditional courses in English departments, for example, were concerned with the study of literature. They rarely, if ever, included creative writing or discussion of the creative process, and if academics wrote novels this was regarded largely as a hobby. However, in the last two to three decades, the idea that arts practice might be a form of research has been developing ascendency. Terms such as practice-led research have been developed by creative practitioners, partly for political purposes within higher education, research and other environments, to explain, justify and promote their activities, and to argue – as forcefully as possible in an often unreceptive environment – that they are as important to the generation of knowledge as more theoretically, critically or empirically based research methods.

At the basis of the relationship between creative practice and research is the problematic nature of conventional definitions of 'research', which are underpinned by the fundamental philosophical quandary as to what constitutes 'knowledge'. Definitions of research used in higher education are almost always similar to the OECD definition:

> Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications.

This suggests that research is a process which generates knowledge, but takes knowledge as being an understood given. There is in this definition an implication that knowledge is generalisable (that is, applicable to some other process or event than that which has been studied in its production), and transferable (that is, can be understood and used by others in a manner which is essentially congruent with that of the original). It can be argued that artworks often embody such generalisable and transferable knowledge, so that aspect of the definition is not necessarily problematic to creative arts practitioners (if they 'increase the stock'), though higher education administrators may find the idea that art can transmit knowledge more problematic. However, there is also an unstated implication in this definition, or at least in most interpretations of it, that knowledge is normally verbal or numerical. Since it is clear that a sonic or visual artwork can sometimes transmit knowledge in non-verbal and non-numerical terms, we believe that any definition of knowledge needs to acknowledge these non-verbal forms of transmission. It also must include the idea that knowledge is itself often unstable, ambiguous and multidimensional, can be emotionally or affectively charged, and cannot necessarily be conveyed with the precision of a mathematical proof. This concept of knowledge as unstable is fundamental to a postmodernist view of the world. But the idea that there are only falsifiable hypotheses, not absolute truths, is also at the core of a conventional Popperian approach to scientific knowledge.

Research, therefore, needs to be treated, not monolithically, but as an activity which can appear in a variety of guises across the spectrum of practice and research. It can be basic research carried out independent of creative work (though it may be subsequently applied to it); research conducted in the process of shaping an artwork; or research which is the documentation, theorisation and contextualisation of an artwork – and the process of making it – by its creator. Although they overlap, and one of purposes of the book is to show this, it is important to distinguish between these different modes of research. For example, research undertaken for the writing of a novel may involve the consultation of known historical sources. However, this research is normally 'secondary' rather than 'primary' because it does not usually constitute activities which are central to basic historical research, such as comparative interpretation of sources or the discovery of new sources. Having said that, the novel may convey the impact of historical events on the lives of ordinary people in ways which are difficult to glean from those sources, which show the information they contain in a new light, and which are intellectually and emotionally extremely powerful.

Attempts at definitions of research, creative work and innovation are all encircled by these fundamental problems – that knowledge can take many different forms and occur at various different levels of precision and stability, and that research carried out in conjunction with the creation of an artwork can be both similar to, and dissimilar from, basic research. It is essential to bear these complexities in mind in thinking about how we can usefully develop and promote creative practice, particularly with respect to research in higher education and the arts community more broadly. But it also important to relate the research which leads into or out of creative practice to the more conventional trajectories of qualitative, quantitative and conceptual research.

An assumption behind qualitative research is that the best way to gather data about an issue or idea is to allow the subjects to express their thoughts in their own way, rather than making it essential for them to respond to a preconceived analytical framework drawn up by the researcher. The qualitative approach to gathering data permits both documentary evidence (where the researcher has no contact with the person who provided the evidence) and investigational evidence (where the researcher talks with those who can provide information).[1]

In contrast, the essential ideal of quantitative science is that the subjects or entities under observation are only exposed to changes in a single factor, while everything else remains in a constant state. Quantitative science is normally set up such that a numerical entity can be measured, whereas the qualitative researcher gathers verbal, and occasionally visual or sonic, evidence. Although qualitative and quantitative research are distinct, qualitative researchers often turn to analytical methods which are intrinsically quantitative at some stage in the process. For example, discourse analysts who are fundamentally qualitative researchers sometimes use Leximancer – a software for discourse analysis which uses mathematical or statistical quantitative methods – in order to extract commonalities, or recurrent 'themes', in the recorded discourse.

The two approaches, the quantitative and the qualitative, differ in their assumptions about the possible degree of separation between the researcher and the researched. The qualitative researcher, like the contemporary anthropologist (see Chapter 13 by Sharon Bell), recognises that their presence inevitably influences the situation. However, the quantitative researcher, such as the cell biologist observing cultured cells, hopes and expects that the results will not be influenced by the human environment in which the data is gathered.

Conceptual research is often seen to sit within the qualitative tradition but is not necessarily identical with it. Conceptual research is more to do with argument, analysis and the application of theoretical ideas, and is central to humanities research. It usually involves reading and textual analysis, although

the way that conceptual research is conducted has changed over time. Practice-led research practitioners who are particularly concerned with the relationship between theory and practice will see this kind of research as being most relevant to them. We similarly argue for its importance, but also point out that it is only one of many methodologies on which the practitioner/researcher can draw.

The relationship of practice-led research and research-led practice to all these research approaches is complex, and some commentators take the view that practice-led research is a new and distinctive form of research that is developing its own domain-specific methodologies. Our own view is that qualitative, quantitative and conceptual research are all approaches to research which creative practitioners will benefit from knowing about and engaging with, and the broader the research horizons of the creative practitioner the better. At the same time we would argue that that the unique combination of creative practice and research can sometimes result in distinctive methodological approaches, as well as exhilarating findings and artworks.

PRACTICE-LED RESEARCH AND RESEARCH-LED PRACTICE

The term practice-led research and its affiliates (practice-based research, practice as research) are employed to make two arguments about practice which are often overlapping and interlinked: firstly, as just indicated, that creative work in itself is a form of research and generates detectable research outputs; secondly, to suggest that creative practice – the training and specialised knowledge that creative practitioners have and the processes they engage in when they are making art – can lead to specialised research insights which can then be generalised and written up as research. The first argument emphasises creative practice in itself, while the second highlights the insights, conceptualisation and theorisation which can arise when artists reflect on and document their own creative practice. Candy (2006) helpfully uses the terms 'practice-based' and 'practice-led' to distinguish between these different emphases. For her, in practice-based research the creative work acts as a form of research, whereas practice-led research is about practice leading to research insights; however, these terms are often used much more loosely. Increasingly it seems that practice as research can best be interpreted in terms of a broader view of creative practice which includes not only the artwork but also the surrounding theorisation and documentation.

In the discourse of practice-led research, the idea of the artwork as research, and the artwork plus surrounding documentation as research,

occurs with different degrees of emphasis in the work of different commentators. In previous work Brad Haseman (a contributor to this book) conceptualised the new research paradigm generated by practice-led research as performative research, which he saw as distinct from both qualitative and quantitative research (Haseman 2006). He argued that an artwork embodies research findings which are symbolically expressed, even while not conveyed through numbers or words (which are themselves symbols). He also elaborated on the various research strategies that can be employed in the making of an artwork, and the role of self-generated commentary about it. His concept of performative research stems from J. L. Austin's notion of performative speech acts as 'utterances that accomplish, by their very enunciation, an action that generates effects' (Haseman 2006: 102). In this category of research 'symbolic data work performatively. They not only express the research, but in that expression become the research itself' (Haseman 2006: 102). In performative research 'practice is the principal research activity' (Haseman 2006: 103) and Haseman emphasises the way practitioners 'tend to "dive in", to commence practising to see what emerges' (Haseman 2006: 100). At the same time Haseman sees practitioners implementing strategies from the qualitative research tradition:

> But these will typically be inflected differently from their qualitative application. Most commonly, performative researchers progress their studies by employing variations of: reflective practice, participant observation, performance ethnography, ethnodrama, biographical/autobiographical/narrative inquiry, and the inquiry cycle from action research. (Haseman 2006: 104)

So for Haseman both the artwork itself and the surrounding practices are research.

Barbara Bolt emphasises less the artwork as a research expression in itself (though she by no means discounts this) and more the kinds of research insights which can develop out of practice and can then have a more general applicability. To do this she distinguishes between practice and 'praxical knowledge'. Using Heidegger's examination of 'the particular form of knowledge that arises from our handling of materials and processes' (Bolt 2007: 30) and his concept that 'we come to know the world theoretically only after we have come to understand it through handling' (Bolt 2007: 30), she argues, similarly to Haseman, that there can arise out of creative practice 'a very specific sort of knowing, a knowing that arises through handling materials in practice' (Bolt 2007: 29). This is what she means by 'praxical knowledge' (Bolt 2007: 34); its insights, she argues, can induce 'a shift in thought' (Bolt 2007: 29), and while she suggests a reciprocal relationship between theory and practice,

'theorising out of practice is . . . a very different way of thinking than applying theory to practice' (Bolt 2007: 33). She posits that when such knowledge is written up (for example in the case of the postgraduate student in a thesis 'exegesis'), 'particular situated and emergent knowledge has the potential to be generalised so that it enters into dialogue with existing practical and theoretical paradigms' (Bolt 2007: 33). For her, creative practice as research must involve such writing-up, and she argues that 'practice-only postgraduate research can disable practice-led research by confusing practice with praxical knowledge and severing the link between the artwork and the work of art' (Bolt 2007: 33–4).

In using the term practice-led research, we as editors are referring *both* to the work of art as a form of research and to the creation of the work as generating research insights which might then be documented, theorised and generalised, though individual contributors may use this and related terms rather differently. Ideally we would expect a research element to be present in both research and work creation, though we would normally see the documentation, writing and theorisation surrounding the artwork as crucial to its fulfilling all the functions of research. In our view for an artwork itself to be a form of research, it needs to contain knowledge which is new and that can be transferred to other contexts, with little further explanation, elaboration or codification, even if this transferral involves a degree of transformation. However, we also recognise that debates about how much a particular work of art constitutes research are not likely to be productive.

Research-led practice is a terminology which we use to complement practice-led research, and which suggests more clearly than practice-led research that scholarly research can lead to creative work. For us it originates in the contemporary modus operandi of science, engineering, technology and medical research, in which research work is directed not only towards the elucidation of falsifiable ideas but also towards the production of practical outcomes, whether they be pharmaceuticals or physical machines.[2] But research-led practice is potentially not only primary to science, but also important in the creative arts. Many new fields of artistic endeavour have been initiated as a result of basic research work which was not originally intended for that purpose; this has been particularly important at a technical and technological level and is currently intensifying. For example, the evolution of computer music has been facilitated by the development of faster and cheaper computers and by the science of digital signal processing, originally intended for quite pragmatic (often military) technological purposes. Similarly, video and new media technology has propelled a massive growth of intermedia art forms and processes and their distribution on the Internet in a manner which now dominates the consumption of most avid creative arts enthusiasts. Smaller-scale research outcomes may initiate and inform other aspects of creative work:

for example, recent research findings about the plausible intended medical functions of Stonehenge – particularly as conveyed by their journalistic coverage (Kennedy 2008) – may in the future trigger artworks that present the socio-economic contexts of the stone structures in a previously unexpected light.

Both practice-led research and research-led practice are often carried out collaboratively. Creative practitioners sometimes join forces with a researcher more specifically oriented towards basic research work. Occasionally, one or a group of collaborators may be active in both creative work and research, but more often several people with differentiated roles interact effectively with each other.

Research-led practice takes different forms in different fields and is more prominent in some areas than others: we have already mentioned new media and music as disciplines in which it has been quite strong. In other areas the full impact of research-led practice is still to be fully felt, and we can regard it as a developing area as much as practice-led research. In creative writing, for example, research-led practice is mainly conceptual and tends to be driven by critical and cultural theory: see Krauth and Brady (2006) and Dawson (2005). The impact of theory on practice can be found not only in novels and poems but also in hybrid genres such as fictocriticism which bring creative and critical writing together (see Chapter 6 by Anne Brewster). But there are many other relatively untapped possibilities for research to feed into creative writing. For example, experimental cognitive research into the activity of creative writing could be carried out by assemblages of psychologists and writers. Such research could lead to more understanding of the writing process and suggest how new approaches to writing might be developed – experiments of this kind could also provide a basis for computational models for the generation of text. We will see, later in the book, examples of such cognitive research in relation to contemporary dance.

As editors we envisage that those involved in the creative arts – in the higher education context, in particular, and to some degree in the community at large – will increasingly recognise the existence of both patterns of activity: practice-led research and research-led practice, and that more and more people within the university environment will be energised with regard to both. However, we do not see the two patterns as separate, but as interconnected in ways which are very complex. Hence our construction of the model which we elucidate later in this chapter, a model we call the iterative cyclic web. This model combines the cycle (alternations between practice and research), the web (numerous points of entry, exit, cross-referencing and cross-transit within the practice-research cycle), and iteration (many sub-cycles in which creative practice or research processes are repeated with variation).

It will also be obvious by now that the interweaving of research and creative

practice is generating new pedagogical tools and shifting educational paradigms. For example, students of literature who find the modernism of James Joyce or the contemporary experimentalism of American language poets difficult may start to understand those texts much better if they try out some of the techniques that drive them. Conversely critical and cultural theories (even sometimes ones which are out of favour) can, with some effort, be adapted to the process of making an artwork.

OUR OBJECTIVES IN DEVELOPING THE BOOK

Our primary objective in developing the book was to discuss the methodological, theoretical, practical and political issues surrounding creative practice and research within the university. It seemed to us that the discourse of practice-led research was very illuminating about the theoretical and technical insights practice could produce, and the significance of creative work and its surrounding practices as a form of research and contribution to knowledge. However, in emphasising the value of creative work, this discourse sometimes underplayed and under-conceptualised the impact that primarily academic research could have on creative practice, and the rich results the appropriation of a wide range of research practices by creative practitioners could bring. Our experience of postgraduate supervision also convinced us that practitioners who were uncomfortable with research (particularly theory) often benefited from exposure to it early on in their degrees and that, in some cases, this was more likely to cause a paradigm shift in their thinking than working outwards from creative practice. Hence we wanted to consider research-led practice as well as practice-led research.

Another important objective of the book was to propose models and methodologies for the relationship between creative practice and research which would enable practitioner/researchers to understand and develop the processes involved. It is evident from all the chapters in this book that practice-led research and research-led practice are creating not only new forms of research and creative work, but also a significant body of knowledge about creative processes which will feed back into the work of future practitioners.

Our desire to produce the book was also predicated on our view that it is pointless for creative practitioners to work within the university unless the university environment responds to them and they respond to it. In other words we argue that creative practice in the university will be most fertile if its practitioners actively engage with other kinds of research activity rather than being somewhat estranged from them. We hope that the book will be used not only by creative practitioners, but also by researchers in the humanities and sciences who wish to understand more fully the work that creative

practitioners do, and the way that it relates broadly to research practices and possibly to their own research. We also hope that the book will be perused by university leaders and research administrators, and that it might increase their understanding of the rich possibilities in this area as well as the issues involved in its evaluation. Similarly, we would like the book to be read by scientists and social scientists who might regard their research as quite separate from creative practice, but whose work might well relate to it, and have an impact on it, in ways of which they are unaware (for example, through the possible application of a new technology they are developing).

In commissioning the essays we were keen to keep the focus tight but also to probe issues around the increasingly developing discourse of practice-led research. Contributors were given an outline of the aims of the book: 'to view the relationship between research and creative work not only in terms of practice-led research but also in terms of research-led practice' and 'to explore the multidimensional, reciprocal and iterative relationship between research and practice, including comparisons between research and practice in the creative arts and sciences'. Different suggestions were then made to the authors of different sections of the book. So in approaching our authors, we pointed to both patterns (practice-led research and research-led practice) and in some cases to the idea that they could form a cycle. However, throughout the book, authors were free to engage with whichever issues seemed particularly pertinent to them, to focus on some more than others and to take any perspective on them. While we provided both conceptual and detailed feedback on the drafted articles, these were only to be taken as queries for authors to consider rather than as ideas which should necessarily be pursued.

While there are literally hundreds of books about 'qualitative research' and even more about 'quantitative research' methods (many not revealing their focus in their titles), there are still relatively few about practice-led research and the other issues which are central to our book. The edited volume by Barrett and Bolt has been mentioned already; it is an important contribution to the field, though it is characteristic of other volumes in this area in being restricted to authors from a small number of countries, in this case solely from Australia. Editors and authors in two other valuable volumes in the area are also locally concentrated; in Cahnmann-Taylor and Siegesmund (2008) they are exclusively from the US and Canada; and in Macleod and Holdridge (2006) they are largely from the UK and Ireland. We have sought a broader geographic span of contributors. The previous volumes are heavily focused on the visual arts, where the terminology and debates probably most pointedly originated, with some discussion of creative writing and dance. Within the field at large, and within these books, there is a relatively small number of articles on theatre, film and music. In our collection we have tried, to some degree, to redress this imbalance.

RESEARCH AND CREATIVE PRACTICE IN OUR OWN WORK

Our own work, much of which has been produced collaboratively, has evolved through a considerable melding of research and creative practice, and we have engaged with both practice-led research and research-led practice. The reciprocal relationship between the research and the creative work has taken numerous different forms. It has included symbiosis between research and creative practice in which each feeds on the other; hybridisation of the many discourses surrounding them; transference of the characteristics of research onto practice and vice versa; and alternations between research and creative practice, often within a single project.

Our creative practice has involved many types of activity and process, from works of music (Roger) and literature (Hazel), to a variety of collaborative multimedia and performance works usually employing new technologies. Our research practice has also been diverse, including free-standing research theoretical, qualitative, quantitative and empirical; research undertaken as part of the genesis of a creative work in relation to both its technical aspects and its content; and research as documentation and theorisation of the creative work. Roger has a background in research in biochemistry as well as in the humanities and the creative arts.

There are many examples within our work, both individually and collaboratively, of projects starting with a research idea or with creative work and then forming a chain of alternations between creative research and creative practice as well as fusions between them, with outputs of several different types. Below we both give examples of pathways of this kind in and around our creative arts work.

Hazel

> One example of a trajectory in my work where research and creative practice inform each other is as follows – though I could produce scores of others. In 2000 I published an academic book *Hyperscapes in the Poetry of Frank O'Hara: Difference, Homosexuality, Topography* (Smith 2000). The book is scholarly in format but shows the application of my creative writing techniques to my scholarly writing in the invention of neologisms to theorise various aspects of O'Hara's work. It includes a short section on gossip; I realised as a result that I was fascinated by the concept of gossip and enthusiastic about producing a creative work about gossip: I imagined this as a collaboration with Roger and discussed it with him. In 2000 Roger and I put a proposal to the Australian Broadcasting Corporation's 'Listening Room' programme

for a new work with the proposed title, *The Erotics of Gossip* (Smith 2008). The piece was to be what we call a sound-technodrama, combining sound, text and digital manipulation of both sound and text. To write the piece I researched the academic literature about gossip, which is fascinating because it stretches over so many disciplines including anthropology, history, philosophy and linguistics. I read about gossip in western and non-western societies, and I perused the academic literature surrounding slander, rumour, talk and conversation. I found that there were essentially two camps of thought about gossip: the first camp sees gossip as creative, as subverting social norms and as ethical; the other sees gossip as destructive, as making people conform to social norms and as unethical. In the piece I tried to project both faces of gossip by fictionalising, narrativising and dramatising material from the articles and books I had read. These included legal cases from early Modern England and nineteenth-century America, different anthropological rituals with regard to gossip in non-European societies, and ideas about gossip and the media.

However, this was not the end of the process. In 2003 Roger and I jointly wrote an article together in which we theorised various technical aspects of the piece, particularly the incorporation of voicescapes – a voicescape being a multidimensional and multidirectional projection of the voice into space which also involves digital transformation of the voice (Smith and Dean 2003). Subsequently I documented this work in another essay which focused exclusively on *The Erotics of Gossip*, and theorised it in the light of a concept I invented: 'performative fictocriticism' – fictocriticism is a well-established concept but performative fictocriticism is not (Smith 2005). In this same article I also considered, more expansively, the theories about gossip which had informed the piece, and developed my own theory of gossip: that it could be both creative and destructive, ethical and unethical, depending on the historical and social circumstances.

It would be difficult to characterise the trajectory I have just outlined as entirely research-led practice or practice-led research; it clearly constitutes both, and what is important here is the mutual reciprocity. It started with an academic research project (the book on O'Hara) which was not directed towards the production of creative work, and the creative practice arose out of one very small section of that project – in that sense the creative trajectory which evolved was quite tangential to the original project, demonstrating the diffuse and indirect nature of the stimuli involved. However, other creative projects also arose out of the writing of the book, producing many examples of the way the connections between practice and theory can proliferate. The creative

practice (the writing of *The Erotics of Gossip*) was itself informed by research but of a somewhat different kind. I assembled and read the literature about gossip without attempting to write a research paper on it or make an original contribution to the field. Rather the original contribution would be the radio piece, a work which contained fiction and poetry but also some theoretical allusions. This process was then (temporarily) rounded off with two attempts at documenting the process and theorising some aspects of the piece, also resulting in the first beginnings of a more general theory about gossip. But the process I have outlined here is actually an ongoing one, and putting a boundary round it – as if the process had a definite beginning and end – is somewhat falsifying. For instance, the notion of the voicescape is one that Roger and I have worked with in subsequent creative works (Smith 2008); I have also developed it in further critical writing with respect to work other than my own (Smith forthcoming). And I could easily imagine myself engaging in further projects on gossip in either a research or creative capacity.

This is one example of the way research and creative practice speak to each other in my work, but I have also been strongly involved in practice-led research and research-led practice through analysis of the creative process in a pedagogical context. Many of the ideas for my book *The Writing Experiment: Strategies for Innovative Creative Writing* arose out my own creative practice (Smith 2005). The book aims to demystify the creative process by breaking it down into incremental stages, thereby recuperating consciously some of the more hidden or unconscious aspects of the writing process. The philosophical stance driving the book is that a systematic approach to writing can lead to open-ended outcomes, that any lively creative practice is a form of experimentalism in the sense of trying out different approaches, and that practice makes perfect. However, again the bi-directional relationship between research and practice is evident because the exercises in *The Writing Experiment* arise both out of practice itself and also out of the application of theory to practice; this combination informs the pedagogical focus of the book at every turn.

Roger

I have long been interested in algorithmic (computational) techniques for generating and controlling musical flow for composition and real-time improvisation. In the mid-1990s, using the programming platform MAX, one of my long-term creative projects involved a continuing series of algorithmic works which related to minimal music, the

rhythmic repetitive and usually melodic style initiated in the 1960s by Terry Riley, Steve Reich and others. The repetitions often create 'phase changes' in the relationships between multiple streams of an unchanging melody. Like the American computer music composer Bill Duckworth in the late 1980s, I wanted to develop a compositional, algorithmic variant of minimalism, in which the melodic patterns were also subject to progressive change and might be rather less tonal (key-centred) than previously: compositions of this kind later became known more widely as post-minimalist. So from 1996 onwards I used MAX to generate such algorithmic transformations of melodic streams which were then realised on synthesisers or sampled keyboards [for example Smith and Dean 2001]. This practice was facilitated by developments carried out by researchers in hardware and in computing which produced fast computer processors and the programming platform MAX.

This creative work then led back into my research. In 2004 I became involved in research in music cognition. In a project designed to research listeners' capacity to segment musical streams, to perceive change and to identify affect, I used algorithmically generated sounds and music – related to those I had developed in my creative work – as empirical material. Among the benefits of this approach is the opportunity to rigorously control features of the music so as to set up experimental comparisons (Bailes and Dean 2007). For example, algorithmically generated sounds can be designed to test whether a note within a musical phrase is perceived as segmenting the phrase when it is transformed in pitch or dynamic. Currently, in collaboration with Freya Bailes from MARCS and Geraint Wiggins (Goldsmiths College, University of London), I am also investigating whether computational prediction of segmentation perception can succeed with these precisely controlled musical patterns.

Research-led practice and practice-led research are repeatedly interacting in this work as in the computer music field more broadly. I expect that an eventual outcome will be the construction of a software entity for making music based on a cognitive model which applies statistical approaches to predict the perception of segmentation and affect computationally. If this happens, it will represent a successful instance of basic research leading to a significant creative practice outcome.

In another example of the way in which practice and research can interconnect, I have suggested elsewhere that algorithms can produce a translation of image into sound which mimics synaesthesia, either through the sharing of data or through a manipulative process which

> acts simultaneously on both an image and sound stream. This research has not only led to several image-sound creative works, but also fed into empirical studies of the impact of auditory events on the perception of flashes (Wilkie et al. 2008). In this work we confirm that multiple auditory events can create the illusion of multiple flashes, and find that this effect can be influenced by musical parameters such as the pitch patterns of the auditory events. Such studies of cross-modal perception will eventually be quite important for the ongoing artistic development of intermedia real-time creative work, since a creator must inevitably take an interest in user perception.
>
> Just as Hazel has contributed to the development of practice in her creative arts field through her book *The Writing Experiment*, so I have written a book specifically for those wishing to learn musical improvisation techniques (Dean 1989). I have also followed up with research books which provide a counterpoint useful to both practitioners, appreciators, and academics (e.g. Dean 1992, 2003; Smith and Dean 1997).

Hopefully these examples of our research and creative work indicate our enthusiasm for their interfaces, and more broadly, their continuously dynamic interaction.

A SURVEY OF PRACTITIONER/RESEARCHERS IN HIGHER EDUCATION

As part of our research for this project, we sent out a questionnaire to practitioner/researchers.[3] Respondents were invited to contribute their thoughts in the context of the present book, whose title was defined. The questionnaire begins by simply raising the topics of 'creative work' and 'research', without describing them but implying that they might bear any relation to each other (from congruent to mutually exclusive). This was intended to allow the respondents to approach the topic relatively freely, and initially almost entirely from their own current perspective. After the first five, the questions become more specific and more concept-laden, but we always imply a wide range of choice. These later questions are prefaced by an indication that they penetrate further into the previous topics and that respondees may wish to answer in a manner that depends on their response to the more open-ended group. Finally, there is an opportunity for comment on any topic or opinion not addressed elsewhere.

There were eighteen responses, seventeen substantial and virtually complete. They came from Australia, the UK and the USA, and four were from

contributors to the volume. All but three of the respondees considered themselves significantly active in creative arts work and release their work regularly to the public. All were employed in higher education, as well as possibly otherwise. Naturally the editors did not complete the questionnaire. Some of the answers can be fairly categorised into yes, no or 'unsure/ambivalent' and some are numerical. Table 1.1 summarises these particular responses (please check the questionnaire in the Appendix for the precise wording of the questions).

The striking features of the categorical or quantitative responses are the large number of hours most researcher/practitioners report working in the university environment, their preference for that environment and their corresponding longevity of service. It is notable that only about one-third of total work hours are construed as time for creative work, and perhaps correspondingly six out of fourteen respondees would like to change their work time distribution, in all cases to permit more creative work time. It is apparent that respondees perceive a considerable divergence of views about creative work and research not only within universities, but also amongst their creative peers outside the university. As might be anticipated amongst academics, fourteen out of fifteen respondees feel that they combine research and creative work in some of their activities, twelve out of sixteen document and/or theorise their creative arts work, twelve out of sixteen believe familiarity with cultural theory is valuable for practitioners, and ten out of seventeen believe familiarity with the arts is desirable for academics at large.

There was a wide range of views about terminology, probably reflecting its current instability. And while a majority of researcher/practitioners find the university environment supportive or stimulating, thirteen out of fifteen believe the status of creative practice in universities could be improved. Indeed they confirm the need for books of this kind, and for a significant advance in both the understanding, role and impact of creative arts work in universities, as we argue in this chapter.

Amongst the more discursive and distinctive answers, most people tried to balance both the reciprocity and the independence of research and creative work. Jennifer Webb (University of Canberra, Australia), for example, brings out the characteristics of both while also suggesting that they cannot be kept entirely separate:

> Creative work: the use of the imagination, what Paul Carter calls 'material thinking', and technical skills to make an object that can be understood as a matter of 'thinking out loud', of thinking visually, of testing the limits of form . . . and etc.: it's so broad! But I do see the combination of imagination and technique as central to this work.
> Research: the systematic, analytical, reflective gathering and analysis of

Table 1.1 Categorical responses to the questionnaire

	Question	Y	N	A	Avg.
1.	Are 'research' and 'creative work':				
	separate?	2		1	
	overlapping?	10		3	
	one thing?	2	2	3	
3.	Do you work within a university?	18			
	How many hours/week?				50 (14)
	How many years? (approx. fte)				13 (17)
	Is it your preferred workplace?	12	1	1	
4.	Do you make creative work and release it?	15	3		
	Hours/week?				18 (12)
	Years of activity?				21 (14)
	Would you like to change the distribution of your work time?	6	7	1	
5.	Is your view of the research/creative work relationship similar to				
	your university colleagues'?	5	8	2	
	your creative arts peers' (outside the university)?	7	5	3	
6.	Do you combine research and creative work?	14	1		
	Do you regard creative work as a form of research?	10	2	2	
	Do you engage in some research which is independent of your creative work?	11	4		
	Do you usually start with research and move into creative work?	2	5	5	
	Would you describe your work as 'practice-led research' ?	3	3		
	or 'research-led practice'?	1			
	or was the response both/ambivalent			6	
	or was the response neither		3		
	Do you document/theorise your own creative work?	12	3	1	
	Do you work with hybrid forms which combine creative and critical work?	7	2	2	
7.	Do you find the university environment supportive/stimulating with regard to your creative practice?	8	6	1	
	Could the status of creative practice in universities be improved?	13		2	
8.	Is it useful for a creative practitioner to be familiar with cultural and critical theory?	12	2	2	
9.	Should academic researchers have familiarity with the arts?	10	4	3	

The table summarises the numbers of explicit responses to certain questions, as yes (Y), no (N), ambivalent or unsure (A), or in some cases as a numerical average together with the number of responses averaged (presented as average followed by number of respondees in brackets). Note that not every respondee gave an explicit answer to every question, and so the numbers of responses are in all cases less than the number of respondees (18).

material that is directed to finding something out, answering a question, filling a gap in knowledge. I would see the combination of rigour and technique as central to this work. Of course they do overlap at times, and in places. Depends on the project.

The response from Glen McGillivray (University of Western Sydney, Australia) focuses on the way each can enhance the other:

> I believe there are activities involving a creative outcome that are not necessarily research and research activities that do not have creative outcomes (apart from a general definition of creativity that relates to human imagination). That being said, particularly in the performance area, aspects of research can be enhanced by creative projects and vice versa . . . practice-led research, I believe, requires the rigorous formulation of a research question and methodology.

Simon Biggs (Edinburgh College of the Arts, UK) draws attention to the various kinds of research which feed into his creative work:

> I do applied research to develop new software and hardware systems that are used in my creative art practice. I do theoretical research to support the development of my creative work and in order to develop critical perspectives on artistic practice in my field. I do contextual research to keep abreast of developments in my artistic field. I do pedagogical research to inform my work as an academic and to seek ways in which creative practice and research can function in a complementary manner.

Similarly Nicholas Till (University of Sussex, UK) sees himself as engaged in different modes of research for different purposes; they are distinct but not entirely separate:

> I do to some extent differentiate between research undertaken *for* creative work and research *through* creative practice – the latter is often more concerned with formal or technical aspects, but to the extent that my work is theoretically informed the distinction is not absolute.

The degree of satisfaction with regard to the status of creative work varied from country to country. There was more satisfaction in the UK, perhaps because creative work is explicitly regarded as research within the Research Assessment Exercise (RAE). In Australia the federal Department of Education Science and Training (DEST) has not up until now – except for a short period in the 1990s – included creative works in the calculation of the Research Infrastructure Grants, and the future situation is unclear. Consequently, there were seen to be more incentives for producing research than creative work. Marcelle Freiman (Macquarie University, Australia) says, for example:

> DEST outcomes value creative work as lesser than research output, and it's hard not to be caught up in this, as the pressure is on to remain 'research active' and produce articles that appear in refereed journals. My poetry in literary journals, anthologies and book form just isn't seen as significant in comparison to those refereed articles.

Overall, the impression the answers gave was that the respondees were searching for ways of articulating the relationship between creative practice and research, and did not necessarily feel that any one way of speaking about that relationship was adequate. Similarly, there did not seem to be a very strong pre-existing vocabulary or conceptual framework into which they could easily fit their thoughts about the issues. Nevertheless, there was a strong convergence that research and creative practice overlapped, and it was notable that many participants claimed to be active in independent research.

OUR MODEL: THE ITERATIVE CYCLIC WEB

Figure 1.1 illustrates our model of creative and research processes; it accommodates practice-led research and research-led practice, creative work and basic research. The structure of the model combines a cycle and several sub-cycles (demonstrated by the larger circle and smaller ovoids) with a web (the criss-cross, branching lines across the circle) created by many points of entry and transition within the cycle. One intention of Figure 1.1 is to suggest how a creative or research process may start at any point on the large cycle illustrated and move, spider-like, to any other. Very important in the model, with regard to the sub-cycles, is the concept of iteration, which is fundamental to both creative and research processes. To iterate a process is to repeat it several times (though probably with some variation) before proceeding, setting up a cycle: start–end–start. The creator must chose between the alternative results created by the iteration, focusing on some and leaving others behind (temporarily or permanently). In a research phase, this can be viewed as a selection based on empirical data or an analytical/theoretical fit; in a practice phase the choice might be aesthetic, technical or ideological, or somewhat random. Iteration is particularly relevant to the sub-cycles but also to the larger cycle.

The outer circle of the diagram consists of various stages in the cycle of practice-led research and research-led practice, and the smaller circles indicate the way in which any stage in the process involves iteration. The right-hand side of the circle is more concerned with practice-led research, the left-hand side with research-led practice, and it is possible to traverse the cycle clockwise or anti-clockwise as well as to pass transversely. Moving clockwise, a creative arts practitioner may start at the top middle with an idea or play with materials

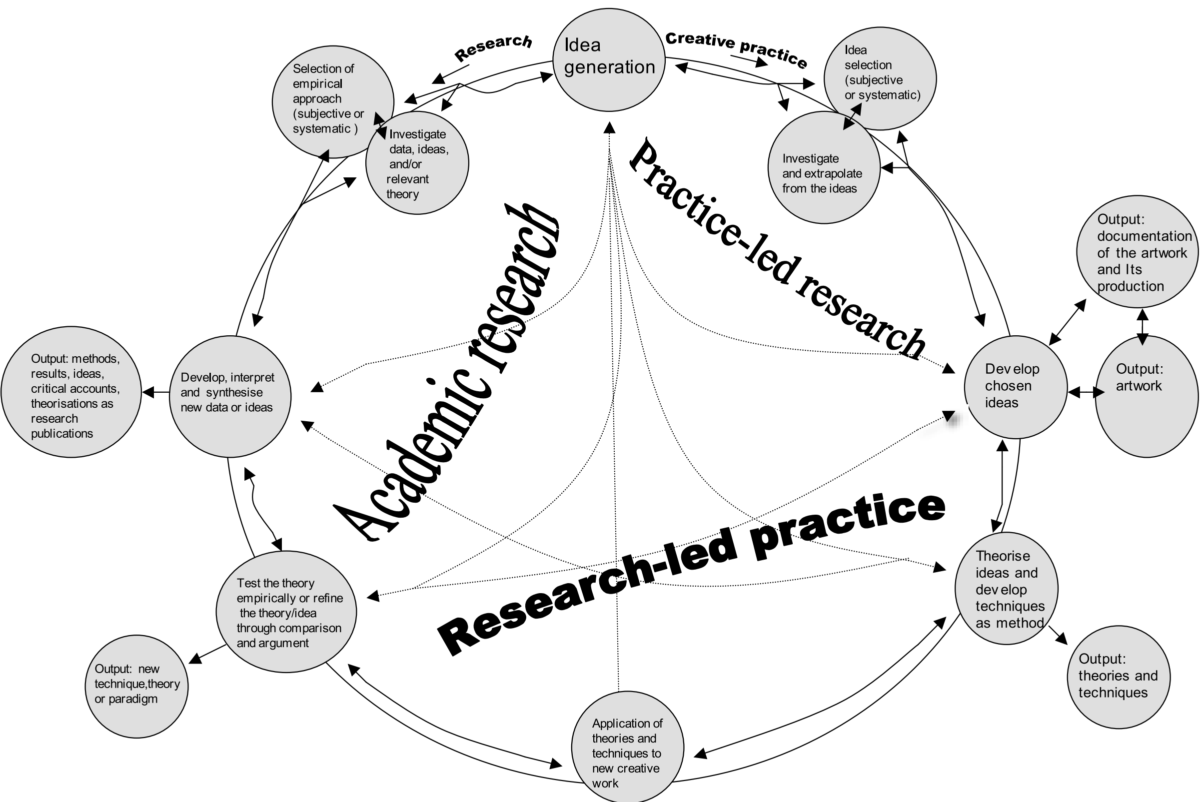

Figure 1.1 A model of creative arts and research processes: the iterative cyclic web of practice-led research and research-led practice.

to generate ideas. This process is followed by the selection of ideas (which may be sounds, images, formations of words) which are pursued through investigation or research. These ideas are then developed and released through publication or other public outlets. If we advance round the circle clockwise we note that publication may be followed by formulation and theorisation of the ideas, processes and techniques which have developed through the creation of the published artwork. These formulations and theorisations may, in turn, also be published and/or applied to the generation of future creative works. However, at every stage of the cycle it is possible to go back to previous stages. So, for example, selection of an idea might instigate a return to the idea/generation stage. Similarly, the investigation/research stage might also result in a revisiting of the generation of ideas and so on. The cycle structure is combined with a web-like structure to demonstrate how it is also possible to jump from one point in the circle to any other. Publication, for example, might result in a reversion to the ideas stage.

Starting at 'idea generation' and moving anti-clockwise is a representation of the research process found in both science and the humanities. If we begin with idea generation and follow the circle anti-clockwise, we move through a series of processes which counterbalance those on the right-hand side of the circle but are more geared towards academic research. The sub-circles refer to different kinds of research from more scientific and empirical approaches to more theoretical or historical approaches. These emphases are, of course, themselves fluid: for example, designing experiments has been thought central to science for a long time, but the extent of empirical work in the humanities is now increasing dramatically. If we pursue the circle round, idea generation leads to experiments, gathering of data and/or analysis of theory or criticism. This may be followed by the development or synthesis of material and can, in turn, lead to the testing of the theory, either empirically or by argument and comparison, with outputs at a number of possible stages.

It is now obvious that this is a reversible cycle and that it is possible to move round it fully in either direction. So theories developed through creative practice on the right-hand side of the cycle might be refined and generalised as part of the research process at the left-hand cycle side, and the web-like structure allows for movement across to the more basic research at any time.

The web-like aspect of the model clearly suggests connections with the Deleuzian rhizome in which any point can be linked to any other and there are 'multiple entryways and exits' (Deleuze and Guattari 1987: 21). For Deleuze and Guattari, 'A rhizome has no beginning or end; it is always in the middle, between things, interbeing, *intermezzo*' (Deleuze and Guattari 1987: 25). Such analogies to the Deleuzian rhizome have been made before in the area of practice as research, for example by Irwin and Springgay (in Cahnmann-Taylor and Siegesmund 2008). They apply the notion of the rhizome to arts-based

research in education through the movement of 'a/r/tography' which 'as practice-based research is situated in the in-between, where theory-as-practice-as-process-as-complication intentionally unsettles perception and knowing through living enquiry' (p. 107). For Irwin and Springgay the rhizome is 'an interstitial space, open and vulnerable where meanings and understandings are interrogated and ruptured' (p. 106). They continue by arguing for its relevance to their own enterprise, 'building on the concept of the rhizome, a/r/tography radically transforms the idea of theory as an abstract system distinct and separate from practice' (p. 106). Strongly influenced by feminist and poststructuralist theory, a/r/tography is concerned with 'relational inquiry, relational aesthetics and relational learning' (p. 115). While these formulations of a/r/tography are elusive, the element of continual and reciprocal transference they suggest is coherent with our model.

As mentioned, Figure 1.1 illustrates how each stage of the large cycle itself usually involves iterations (symbolised by the smaller cycles straddling the main circular cycle) and selections from those iterations. In the process of selection the researcher/practitioner decides which are the best or most useful realisations derived from the task, and discards or temporarily puts to one side the others. Here each iterative step is an example of the operation of a selective pressure, somewhat like those that over aeons determine biological evolution and the success of genes and organisms. Biological processes hinge on the survival of the fittest, but fitness depends on the environment, so not all impressive species survive. Artistic selection processes are likely to be even more arbitrary, and there may be many fine specimens amongst the practitioner's rejects. This occurs because practitioners are making these decisions in relation to the specific artworks they are shaping (what would be suitable for one may not be appropriate for another), or because they might miss a good idea at an early stage of the process where its relevance or potential is not apparent. In addition, although we might be tempted to think of these choices as individually motivated, they are made in response to broader social and artistic forces. So the selection process is more cultural than biological and analogous to the activity of memes – ideas, theories or artefacts which evolve through mutation and competition and are suggested by Richard Dawkins to be the cultural equivalent of genes though over somewhat shorter lengths of time. Memes are discussed in Chapter 4 by McKechnie and Stevens; Estelle Barrett also suggests that the critical exegesis is a kind of meme because it 'may be viewed both as a replication or re-versioning of the completed artistic work' (Barrett 2007: 160).

Another type of selection process is fundamental in A-life (Artificial life) artworks, such as those created by Jon McCormack, which involve silicon-based (computational) organismal systems (McCormack 2003). Here selection is partly determined by the artist but then becomes built into the system.

In fact selective processes are at the core of most models of creativity, from the Geneplore model which characterises the creative process as generate–explore–select–generate, to the 'flow' model of Csikszentmihalyi (1997). But selection is also, as our model shows, relevant to research processes, where choices will occur along the continuum from arbitrary to exact, though usually with more emphasis on precision and contextual relevance than is the case with artistic choices.

Fundamental to our model are at least two different ways of working which are to be found in both creative practice and research: a process-driven one, and a goal-oriented one. To be process-driven is to have no particular starting point in mind and no pre-conceived end. Such an approach can be directed towards emergence, that is the generation of ideas which were unforeseen at the beginning of the project. To be goal-orientated is to have start and end points – usually consisting of an initial plan and a clear idea of an ultimate objective or target outcome. In Figure 1.1 these two different mindsets are signalled at various points, for example the initial idea generation can be one of surrender to the process or one of setting goals, while the ideas selection stage can be subjective (more process-orientated) or systematic (more goal-orientated). However, these two ways of working are by no means entirely separate from each other and often interact, as the model implies. For example, while the process-driven approach obviously lends itself to emergence, in fact at any moment an emergent idea may lead the way to more goal-oriented research. Similarly, a plan is always open to transformation as long as it is regarded flexibly.

The process-driven approach is usually thought to be more common amongst creative practitioners than researchers and almost certainly is, but many practitioners oscillate between process and goal, and may sometimes have an initial plan and/or some eventual endpoint in mind, however inexplicit it may be. Similarly, although research workers in both the humanities and the sciences usually have clear goals, engaging with processes along the way which allow for emergence, and permitting the project to shift in relation to them, is quite common and is often the secret of success. In a pleasingly hybrid way, the human genome project was one with a clear objective (defining the sequence of the DNA constituting the human genome) but also emergent outcomes (defining new and unexpected genes as well as acquiring better understanding of the function of metabolic pathways and the mechanisms of some diseases).

Implicit in Figure 1.1 is also the idea that the large cycle might represent not just the work of one person but that of a collaborative group with distributed expertises. Thus the creative practitioner might develop research skills but at the same time collaborate with a researcher who through engagement in the project takes an enhanced interest in more emergent and less preconceived outcomes. It is obvious that the creative, intellectual and financial environment

in which such collaboration and cyclic reciprocation is most feasible is that of higher education. Within creative arts companies it is more difficult, sometimes because of funding, though a few collaborative groups such as Canadian theatre director Robert LePage's Ex Machina manage to overcome this. Such companies may also have limited access to the complementary expertise of the scientist, the computer scientist or the research anthropologist. In higher education, such expertise would normally be part of the same community, and hence accessible. But the model's rhizomatic structure implies that interactions can take place between individuals from quite different communities and across cultures.

Figure 1.1 highlights some of the many points at which there might be transmissible outcomes. These outcomes can range from artworks to research papers, and might variously take the form of sound, text, image, video, artwork, numerical analysis of empirical data, argument, analysis or description. They might also include hybrid genres such as fictocriticism, itself a product of the rise of practice-led and research-led practices in the university. In the case of the numerical analysis of empirical data, or of argument, analysis or description, these outcomes might contribute to knowledge in humanities or science. If devolved from the process of making a creative work, they might embody understanding of the techniques which have been employed in creating an artwork and contribute to knowledge about the creative process. As we have suggested above, and as discussed elsewhere in the book, the transmission of technical possibilities through increased understanding of method and practice is potentially one of the most valuable outcomes of the rise of practice-led research.[4]

Our model also allows for the possibility that collaboration might not only be between scientists and artists or humanities researchers and artists, but equally between musicians, writers and visual artists, leading to the enhanced possibility of hybrid intermedia outputs. The mutual engagement on a project of practitioners with such a wide range of expertises and backgrounds is one of the most appealing aspects of creative arts collaboration, and potentially one of its most productive and valuable. The creative industries – the moving feast comprising the creative arts, film, TV, digital media and the Internet – in which such collaborations are particularly relevant, require such stimulus and synergy to thrive.

We hope that researcher-practitioners who read this book may use the model in Figure 1.1 to consider how much of the cycle they are actually engaging with, and to consider initiating projects from other entry points to it than those they normally engage. We also like to think it may encourage practitioners and researchers to participate in parts of the cycle in which they are currently absent. Several chapters of this book illustrate various ways in which essentially the complete outer cycle in Figure 1.1 can be fulfilled within projects: for example, Simon Biggs, and Andrew Brown and Andrew

Sorensen, with research in IT and creative arts practice in digital media; Sharon Bell with research in anthropology and creative practice in documentary film; Shirley McKechnie and Kate Stevens, and also Roger Dean, with repeating interactions between cognitive science and creative practice in dance and music respectively; and Hazel Smith and Anne Brewster with theorised humanities research combined with creative writing (in Hazel's case intermedia processes are also involved).

THE OUTPUTS: EVALUATION AND PROMOTION

Creative practitioners have sometimes argued that theorisation or documentation of the creative process risks subduing the creative fire or reducing the range of responses to their work. But such arguments reinforce the mystification of the creative artist and romantic ideas about the spontaneity of the creative process. Creative practitioners traditionally had an ideological investment in such mystification because it shored up the idea of the creative genius. However, there have been numerous examples of influential creative pioneers who laid out their ideas, strategies and critical positions through essays or manifestos: the composer Iannis Xenakis, the Surrealist painters and writers, and members of the writers' group Oulipo are good examples from sonic, visual and literary work. Similarly, there is also a wealth of work by contemporary writers and artists, such as the American language poets, which fuses practice and theory (see, for example, Bernstein 1999). All this suggests that there is no necessary contradiction between theorisation and creative practice, but rather that the combination can be valuable.

Currently there is an increasing trend towards documentation and self-description of creative work – as well as growing recognition of the self-critical awareness which is always a part of creating an artwork – whether or not it is externalised. Nevertheless, there may be certain aspects of the work that practitioners do not want to talk about, such as possible interpretations of it, and the role of the practitioner in these respects remains distinct from that of the critic.

The output points illustrated on our model must necessarily also be the points at which creative and research work is evaluated by others. In higher education such evaluation is necessary to demonstrate to governments that public subsidy is being usefully and valuably spent. But evaluation of outcomes is also requisite within the university to justify the apportioning of resources to creative practice and hopefully to increase the flow of resources to it. In the period in the early 1990s in Australia when creative work itself was argued to be 'equivalent' to research output, many university leaders lacked sympathy for the idea that creative work and research should be treated as equal. As

mentioned above, in Australia creative work has not up to now – apart from a brief period in the 1990s – impacted on the federal government Infrastructure Grants Scheme. However, the situation is different in the UK.

In the current higher education environment, if creative arts work itself can be presented as not only co-equal with research outcomes but also concomitant and interactive with them, it is more likely that support for it will be forthcoming. Thus the juxtaposition and interweaving of practice-led research and research-led practice is critical for the development of both endeavours, and especially for the future of creative arts in higher education.

How can the evaluation proceed? The general evaluation of a particular field by peer-researchers in science remains the most feasible approach, and garners the most acceptance among researchers, though it is far from precise, for example as judged by a detailed study of the peer-review process of the Australian Research Council (Marsh et al. 2008). Currently peer assessment of artistic work does occur at an informal level but hardly operates in a formalised way, so processes for peer review are at an embryonic stage in creative arts in many countries. But peer assessment similar to that common in academia could operate for initial assessment of artistic products; a peer group of practitioners could assess the outputs and methodologies for this have been developed and analysed. The 'consensual assessment technique' using domain experts, developed and applied by Amabile and colleagues, exemplifies this (Amabile 1996). We argue that such an approach is essential, even though peer-assessment in the arts is something of a minefield because of the highly subjective element in judging artistic work, and the tendency for ground-breaking work to be greeted with opprobrium rather than praise.

Peer review is anyway only the first stage in a process of evaluation because as long as the artwork is retained in circulation, recorded or documented, then – as with the scientific paper – a re-evaluation can take place later, and matters of public acceptance can play a more significant role. This public acceptance constitutes a major aspect of the 'impact' of artworks. Here we use impact to mean the degree to which the public engages with the artworks and appreciates them; we are not equating impact necessarily with cultural value, since a work which is esoteric can be extremely rich culturally but have a very limited public impact. In the short term, unfamiliarity – or perceptual fluency as it is known in cognitive research – can limit the impact of the work for some members of the public, but in the long term this issue of unfamiliarity can often be overcome: Harold Pinter's early plays were originally reviled by many, but he is now firmly established in the mainstream. Impact has always been notoriously difficult to assess but the degree to which the public interacts with artworks may become easier to measure through the Internet.

If the impact of an artwork arises out of the degree to which the public engages with it, then it is very different from the way that the public impact of science

operates. The main 'impact' of biomedical science, for example, is practical, whether it leads to useful pharmaceuticals or public health initiatives which reduce disease or enhance quality of life – and public use of published scientific articles is a minor factor in comparison with such practical impact. Of course sometimes artists may be able to engineer social and practical changes through their work, or may be able to liaise with scientists or engineers to further the public good. Rust, for example, discusses convincingly the way designers can work with scientists to considerable social and practical effect (Rust 2004).

Another measure of impact is the issue of long-term peer recognition and use. In the case of scientific research, citation analysis of research publications estimates the number of times other peer researchers have quoted the work of a particular researcher in their own publications and so indirectly how much the work has been used. Again the Internet, together with increased documentation of artists' processes, might eventually permit a similar assessment of peer usage in the creative arts, but this does not exist adequately yet.

As far as processes of evaluation are concerned, therefore, creative arts research could usefully borrow from the scientific model, though the criteria of assessment would need to be radically different. University leaders can no longer dismiss creative work from such consideration, and creative practitioners must be open to it. In fact their mutual participation in evaluative processes is both a necessary and desirable step towards the complete equality of creative arts with other intellectual endeavours within higher education.

One of the reasons that such equality is important is that those involved in higher education need to convince politicians of the importance of both the arts and other academic activities for the maintenance and development of our societies. Many artists are reluctant to couch any argument about the value of art in economic rather than socio-cultural terms, even though they appreciate that politicians tend mainly to be interested in finance. But creative industries are very large industries in developed and some developing countries, and there are considerable differences in the percentage of GDP they contribute between the UK, the USA and Australia. They often supply between 5 and 8 per cent of GDP, but have increased more dramatically in some countries (such as the UK) than others during the last decade. The scope remains for considerable further enhancement of the economic contribution which can be made by art, and one of the roles of higher education academics and creative practitioners is to try to ensure that this happens and that valuable artistic and socio-cultural outputs and impacts ensue, not just direct economic gains. Throsby and others have shown that, in the case of the visual arts, for example, the estimated financial impact of artistic work derives not so much from the sale of work but from other socio-economic factors (Throsby 2006). Quite probably the economic impacts of medical research have been so successfully argued that they are overestimated, while almost certainly those of the creative arts have been both

under-argued and underestimated. But politicians can potentially be engaged and energised by all of these kinds of argument and evidence. This is more likely to be achieved if methods of evaluation are demonstrated and equality of the potential significance of creative arts work, practice-led research and research-led practice is claimed, exploited and promoted.

THE CONTRIBUTORS: KEY ARGUMENTS

The authors in this book engage with a wide variety of arguments about practice-led research or research-led practice. In the opening chapter of Part 1, while focusing on practice-led research in the visual arts, Graeme Sullivan argues that 'artists themselves have the capacity to explore and explain complex theoretical issues that can have significance across broad areas of knowledge' and can make 'intuitive and intellectual leaps towards the creation of new knowledge': for Sullivan 'the artist intuitively adopts the dual roles of the researcher and the researched' in 'a reflexive process'. Consequently, he says, they should be aware of 'the necessity of communicating across fields of inquiry'. Sullivan continues the arguments raised above about the potential importance of practice-led research in universities, pointing to the desirability of 'research practices that are inherently discipline-centred in the arts and humanities'. For him practice-led research implements methodologies which move from the 'unknown to the known', rather than more traditional research methodologies which move from the 'known to the unknown'; he also emphasises processes of data 'creation' rather than 'collection'. Sullivan notes that the work may have outputs which are emergent, including some that are non-verbal – the concept of emergence appears throughout this volume. His chapter concludes with an illuminating discussion of a collaboration in which a New York 'exhibition space was conceived as a research site'.

Simon Biggs (Chapter 3) focuses on 'practice as research' in new media and its recurrent emphasis on 'development and/or application of emergent mediating tools and systems', resulting in its capacity to be highly divergent. In dedicating a section of his chapter to terminology, he points out that there are quite disparate views among practitioner-researchers as to what constitutes practice-led research, that many have not routinely distinguished research-led practice or do not wish to do so, and that there is clearly substantial instability and slippage in the larger discourse about practice and research at present. This is obviously relevant to our own objective of bringing these different axes (practice-led research, research-led practice) into clearer view and our wish to create, if possible, greater stabilisation of terminology. Biggs quotes the UK Research Assessment Exercise (RAE) definition of research which extends from the terminology 'knowledge' to what we might call the 'softer' terms

'understanding' and 'insight'. He discusses the situation of new media artists working in 'what were, for them, alien environments', such as scientific and IT organisations and art galleries. Biggs then presents fascinating results from his survey of new media arts practitioners working in research environments. All of his respondents agreed with the view that research and practice are reciprocal, but many conformed with Stuart Jones' view, quoted by Biggs, that 'the community of my practice is largely different from the community of my research.' Respondents also evinced a wide range of 'formal research methods', listed by Biggs as 'contextual reviews, case studies, interviews, practical experiments, scenario building, action research, user monitoring and evaluation, external assessment through structured audience engagement, version control systems and ethnographic observation/analysis, among others'. Nevertheless, Biggs asks in his conclusion: 'Is it contradictory to employ artists within an institution that then requires them to submit their creative practice for assessment as research?' He continues, in contrast, by asking 'what value artist-led research contributes to art and, indeed, whether it might function to compromise those things we esteem most in artistic practice and its artefacts?' He is optimistic that 'emerging practices and actual outcomes' will eventually provide stronger answers to these important questions.

Shirley McKechnie and Catherine Stevens address practice-led research in dance and its interface with research on cognitive aspects of dance. In response to our book title, they also elaborate significantly on how such academic research on dance cognition may be able to feed back ideas to dance practitioners which influence their creative work, thus generating a cycle similar to that we elaborate in our model in this chapter. Their research is, echoing Christopher Frayling (see Chapter 9 by Judith Mottram), 'in, about and for contemporary dance'. Here knowledge may be procedural and implicit, or declarative and explicit, but it is fundamentally non-verbal: 'contemporary dance declares thoughts and ideas not in words but expressed kinaesthetically and emotionally through movement.' As they argue, knowledge may either arise out of understanding the processes involved in learning dance skills or in developing a dance piece. Their empirical studies of audience responses to dance, and their action research concerning the influence of information provision on these responses, are instructive for practitioners of most non-verbal and temporal arts. They also offer ideas on the documentation of dance which have a broader relevance to creative practice at large, documentation which is now developing in part as a consequence of practice-led research in the higher education environment. In line with our model, McKechnie and Stevens point out that the dance ensemble can be a 'self-organising dynamical system' whose generated variety is subject to 'variation, selection and replication'. Following current understanding of biological evolution, they also emphasise the need for the preservation of diversity in creative practice.

Baz Kershaw (Chapter 5) shares McKechnie and Stevens's focus on what he calls 'practice as research through performance', but with respect to theatrical and performance art, particularly movement based. In an opening illustration flowing from Wittgenstein, Kershaw touches on some of the essential problems of the concept of knowledge as briefly alluded to above. He discusses a 'paradoxology of performance', treating 'theatre and performance as operating in a continuum with natural phenomena, such as seashores and forest perimeters, so that the same principles of ecology can be seen to shape both cultural and natural processes'; this nicely complements the ecological ideas underpinning the preceding chapter by Keith Armstrong. In discussing the evaluation of research through performance, Kershaw illustrates the ambivalences and mutations of the UK Research Assessment Exercise and is notably less optimistic about its openness or positivity for the arts than is Biggs (Chapter 3). He advocates the importance of the 'hunch' in creative and research work: the significance of such hunches is alluded to in a number of the chapters and is also a feature of our model with its indication of 'subjective' selection steps. Kershaw discusses a performance piece nominally investigating the 'aesthetics of . . . body-based spectacle' and also targeting an objective of enhancing 'conservation messages' enacted at Bristol Zoo; again issues of documentation, and its value as well as impact, are analysed. Although documentation and performance can also enter an iterative and productive cycle, Kershaw poses the question: are there dangers in documentation? He puts forward the view, held by some practitioners, of 'ephemerality as *the* essential quality of performance' and the need to be wary of documentation as 'the devil of commodification', but on balance seems to see a positive role for the documentation process.

Anne Brewster's Chapter 6 is a stimulating example of fictocriticism – a hybrid of critical and creative writing – with which she engages to investigate 'contemporary Australian intercultural relations between indigenous and non-indigenous people'. In the chapter she relates fictocritical practices to personally-situated writing in critical whiteness studies, 'a body of theory which aims to open up the cultural reproduction of whiteness and the white subject to scrutiny'. She also argues that in textual studies the juxtaposition of the terms practice and research 'usually signifies the inclusion of bodily experience in writing', and interweaves her argument with reflections relating to fossicking on the beach, an activity which resonates with intimations of the colonial encounter. Her chapter includes a broad discussion of the relationship between research and practice: as she says methodologies are practices and we need to be careful to see these activities as intertwined rather than opposed. Her fictocritical approach embodies the 'doubling' or 'mirroring' by which we can construe practice-led research and research-led practice as complementary and yet part of a single iterative cycle.

Part 2 presents four briefer 'case histories'. As well as distinguishing usefully

between different forms of research – general and academic, experimental and conceptual – Andrew Brown and Andrew Sorensen write lucidly of the fluidity of digital media and the capability of 'the computer as an idea amplifier'. Their algorithmic sound and image 'live-coding' practice, in their ensemble aa-cell, has involved the development of an entirely new programming and performance platform (Impromptu), and continually exploits aspects of the whole 'interdependent' and 'iterative' cycle of practice-led research and research-led practice summarised in our model: as they say, 'the computer system is directly in play and its behaviour and outputs are [among] the objects of inquiry'. They describe the continually changing relationship and nature of their overall goals and their emergent activities, particularly in the context of performance. Discussing the selective steps repeatedly involved in choosing future research paths, Brown and Sorensen also point to the way they try to use the aesthetic responses of their peers as one means of assessing their work.

Kathleen Vaughan provides a substantial contrast to the 'peer community' aspect of the processes described in the preceding chapter. Rather, she provides a highly personalised narrative of the process of production of a particular visual artwork using an approach based on collage. She talks of the aspect of rediscovery – a kind of process of defamiliarisation – in research (in this case with regard to butterflies) and its utility in her artistic process. For her art as research is a 'calling forth, pulling together and arranging the multiplicities of knowledges embedded within' more than a means to create new knowledge; nevertheless the process can have a transformative effect. Although her approach is personal, she includes in her preparation a step of engaging with work by other visual artists concerned with the butterfly or other insects – noting some who collaborated with scientific researchers in their works – and she also plans to take advantage of the opportunity in her present institution for collaboration with digital artists. Vaughan's delineation of the position of creative work within the Canadian higher education funding schemes, notably those of the Social Sciences and Humanities Research Council, is amongst the most optimistic in the book.

Keith Armstrong (Chapter 9) introduces his long-standing 'ecological-philosophical approach to artmaking . . . ecosophical praxis'. The scientific bases of the ecological approach can influence the work at very specific levels, for example in seeking to relate 'energy transfers' in the work to those in the ecosystem at large. But he also considers four ecologies: the 'biophysical', the 'artificial', the 'social' and that of the 'image', which 'strongly mediates the other three'. His interactive group practice involves iterative cycles and collaborations with others of complementary expertise. He idealistically and purposefully 'hopes for the continued emergence of a contemporary eco-political modality of new media praxis that self-reflexively questions how we might re-focus future practices upon "sustaining the sustainable"'.

Novelist and academic Jane Goodall concludes Part 2 with a discussion of popular novels and whether writing such novels can be a research-led practice. She describes, for example, how her academic work in cultural history fed into her first thriller, *The Walker*, including 'hints of an alchemical experiment gone wrong'. Yet she suggests that research alone cannot drive a narrative and relates how she has learnt that 'the spooky art of fiction writing involves a commitment to improvisation and randomness, a submission to the erasure of authorial design, a readiness to be mesmerised by place and possessed by psychological energies from competing directions'. It is important for the novelist not to become weighed down by factual information or technical demands: 'research in the context of the creative arts can actually serve to calibrate awareness of the psychological displacements required to keep the work alive'.

In Part 3, our contributors address some of the educational and political issues surrounding practice-led research. Brad Haseman and Daniel Mafe discuss how practice-led researchers can acquire specific expertise during research training in higher education through the completion of higher degrees. They focus on the case of established creative practitioners who 'undertake higher research degrees and so bring the benefits of research to their practice and discipline'. In most of their discussion 'practice leads the research process' and in this context they delineate and assess 'six conditions of practice-led research', including 'repurposing methods and languages of practice into the methods and language of research'; developing and using peer, professional and critical contexts as well as deciding on the forms in which the outcomes will be embodied; and 'deliberating on the emerging aspirations, benefits and consequences which may flow from the demands and contingencies of practice'. They discuss emergent practice in which aims need not be finely preconceived, the reflexive steps involved in proceeding with emergent outcomes and, importantly, how one can develop 'research training to manage emergence through reflexivity'. At the same time they provide a positive and informative case study on this process and the psychological challenges it presents for its participants. They conclude positively that after completion of their research training often 'practice-led researchers will work in teams with collaborators possessing different methodological strengths, and it will be the supervisor/candidate relationship and its reflexive honesty that will prepare practice-led researchers for this larger contribution to our research and innovation industries'.

Haseman and Mafe's chapter mainly focuses on experienced practitioners who undertake postgraduate degrees. However, there are also graduate research students who wish to become both academic researchers and creative practitioners but who, unlike the participants Haseman and Mafe discuss, want to enter research training soon after completing an undergraduate course rather than becoming established creative practitioners first. We suggest that this will increasingly be an important and popular trajectory for graduates, again

promising to contribute positively to our research and innovation industries (as documented already to some extent in the UK context and discussed in Chapter 12 by Judith Mottram). Furthermore, on a pragmatic level, once attainment of a doctorate becomes a more common feature of the careers of creative practitioners, it will also be one that they anticipate at the outset of their careers, hence creating the demand to which we point. These postgraduates will have rather different needs from their more established counterparts, and are particularly likely to benefit from combining practice and research within the environment of the university. With regard to postgraduate students who are already established practitioners, we note in passing that the chequered history of 'professional doctorates' outside the creative arts must give us pause for care with regard to their equivalents in the creative arts. The Master of Business Administration (MBA) has become a somewhat tarnished commodity, with its extent and demands reduced considerably in some universities from those it originally presented (for example, what formerly required two years of full-time study in some universities now requires one or less). In all such cases, as Haseman and Mafe argue, what is crucial is that high standards be required, and that participants are encouraged (even pushed, but with strong support) to extend their intellectual and creative processes during their research training.

Closely related issues of assessment and establishing value within higher education are central to Judith Mottram's discussion of research and creative practice in relation to the fine arts (Chapter 12). Mottram uses the current codification of a UK Arts and Humanities Research Council review of practice-led research as 'research in which the professional and/or creative practices of art, design or architecture play an instrumental part in an inquiry'. As she says, 'within art and design schools, the focus has not so much been on advancing knowledge as upon generating new objects of attention'. According to her, and in contrast to the feelings of many of our questionnaire respondents, 'the value given to the creative practice of teaching staff in arts disciplines in UK universities has reached almost mythical status', and she finds little overt explanation for this. But she goes on to argue that the 'rising numbers of fine art PhDs provide a new opportunity for conceptualising the nature of the disciplinary academic in the field'. It is in this context that she discusses the development of such doctoral training in the UK, again framing this with Frayling's concepts of 'research in art and design' as research 'for practice', 'through practice' and 'into practice'. She argues that 'if there is no hypothesis, question or objectives, the practice is "normal" practice, not research-led practice'. But she describes her impression that currently, in late 2008, 'the usefulness of stressing "practice" is being questioned' in the UK, and that there is a 'desire to move beyond dependency on the use of the prefix "practice"'. Yet noting that participants in fine art departments in UK universities still make a distinction between research and practice, she indicates

no strong solution to this quandary. Rather, after a brush with geology echoing some of Anne Brewster's 'fossicking', she concludes that in the fine arts, apparently in both practice and research, 'the challenge remains to demonstrate that new understanding is achieved and that this has an impact upon future culture and society'.

Our final chapter, by Sharon Bell, was initially invited as a 'case history', but because of its powerful involvement with educational issues and with politics (particularly those to do with Sri Lanka), we decided to reposition it in Part 3; this decision also acknowledged Bell's own change of emphasis during the writing of the chapter, which she notes. In the context of her film work, together with her experience in academic leadership, and of her own disciplines of anthropology and ethnography, she asks what might be 'ideals for creative production in the academy'? She responds:

> It is tempting to argue that such works of art, in comparison with those produced outside the academy, might be expected to be: more nuanced for the underpinning research; more sensitive for the prolonged and intense processes of reflection; more competently realised due to the practitioner's mastery of technique; more communicative due the artist's sophisticated understanding of their art form and the context in which a body of work has been produced; more 'authentic' due to the lack of a commercial imperative; or more confronting due to the intensely critical and analytical academic environment which at its best encourages risk taking and innovation.

Her discussion is in part about the difficulties in, and barriers to, achieving these ideal outcomes. She contrasts the limited ethnographic studies of the 'tribal territory' of the medical research institute (of which Roger Dean has been a part) with the even more modest studies of the 'academic mode of creative production'. Bell's 'journey from anthropologist (academic) to film-maker (creative practitioner) was in fact a journey borne of frustration with the reified world of Anthropology', but it is also a journey that might now be taken without frustration by the early career practitioner of both research and creative arts during an appropriate doctorate due to the changes in higher education which are making it more receptive to the influence of creative practice. Her chapter also shows her intense commitment to politics, as well as the unstable nature of politics itself: her film *The Actor and The President*, concerning President Chandrika Bandaranaike Kumaratunga and her assassinated husband, Vijaya, is now being read, contrary to some of its intentions, through the lens of the new politics in Sri Lanka. Her later documentary *The Fall of the House* is a reflection on creative arts processes themselves in the case of composer-conductor Eugene Goossens. Arguing for the potentially important

contribution ethnography has yet to make to our understanding of creative work in higher education, she concludes that:

> Forms of intelligence gathering, which are not institutionalised, especially those designed to collect 'dirtier data' and generate a discourse that is 'generically disrespectful and promiscuous' may contribute to discomfort in the sector. Yet more open research paradigms and methodologies are needed to generate understanding of our academic modes of production and a more nuanced understanding of the place of creative production within the academy.

'Intelligence gathering' may be read as embracing both research and practice in the creative arts and as an approach to understanding their place.

The idea that practice can be a form of research is creating a transforming environment within academia. There is an acceleration of conferences devoted to the work of researcher/practitioners, and an increasing number of research publications which include contributions from practitioners. The input of practitioners is, in turn, broadening concepts of how a conference paper can be given (for example, it might take the form of a performance) or how an essay might be written (it might consist of a mixture of creative and critical writing). Disciplines are also changing in response to the greater incorporation of practice. Literary studies, for example, has been shaken up by the inception of creative writing programmes which put the emphasis on process rather than products, writers as much as readers. Similarly the idea of the research group or centre within the university is transforming: the Writing and Society Research Group at the University of Western Sydney, of which Hazel is a member, is as much driven by writing as literature; its title salutes the idea that both creative writing and critical writing are research. It is within this developing environment that we present the fine contributors in this book, and their different perspectives on research, creative practice, art and knowledge.

NOTES

1. Just as there are numerous books on the scientific method, so there are several important series of books on qualitative research, emerging mainly from sociology and cultural studies and ranging to hundreds of items.
2. Research scientists are often aware of the philosophical quandaries research presents, yet are usually much less engaged in their discussion than either humanities academics or creative practitioners. The studies of Bruno Latour, Steve Woolgar, Max Charlesworth and others reveal the relative

lack of involvement of scientists in epistemological discourse despite their intellectual commitment.

3. The questionnaire we sent to creative arts practitioners in higher education is given in the Appendix.
4. This brief discussion of outcomes complements the forthright emphasis that Eisner presents in his discussion of 'persistent tensions in arts-based research'. As the editors Siegesmund and Cahnmann recognise, Eisner's five tensions are illuminating. They characterise the five as: '1) The imaginative vs. the referentially clear; 2) The particular vs. the general; 3) Aesthetics of beauty vs. verisimilitude of truth; 4) Better questions vs. definitive answers; 5) Metaphoric novelty vs. literal utility' (Cahnmann-Taylor and Siegesmund 2008: 232) and their volume addresses most of these. We would not express the ideas in the way Eisner does, but there are parallels between each of these 'tensions' and the ideas implicit in our model.

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PART I

Methodologies of Practice-led Research and Research-led Practice