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# THE ROLE OF THE ARTEFACT AND FRAMEWORKS FOR PRACTICE-BASED RESEARCH

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## **Introduction**

This chapter is concerned with the role of the artefact in practice-based research and the frameworks necessary to the success of practitioner research in the creative arts. We begin with the artefact and its role in research and knowledge creation and go on to place it within the context of practitioner and organizational frameworks. We describe the way in which conceptual frameworks play a central role in the practice-based research process, illustrated by specific examples from recent PhD programmes in the digital arts.

Two types of frameworks underpin and facilitate the practice-based research process: one is practitioner-determined and research-led whilst the other is organizational, comprising funded research and doctoral programmes. The organizational frameworks are important and essential vehicles for giving the artefact a legitimate role in research. These developments have required changes to existing organizational rules and are relatively recent in the history of knowledge production. The opportunities for including artefacts in formal research remain limited on a world wide scale, and those that exist can only be seen as the beginning of a longer transformational process, the consequences of which we are still working through.

There has been a growing awareness in some research communities that the outcomes of creative practice, as presented by practitioners themselves, can make a significant contribution to generating new knowledge. Gradually, for example, practitioner knowledge, with its own unique value, is becoming accessible through the increasing numbers of practice-based doctoral awards. The distinguishing feature of practitioner research in the arts, design and digital media is the importance given

to artefact generation as an integral part of the research process and the generation of new knowledge. New knowledge generated by research, whether practice-based or not, is expected to have two characteristics: first that it is shared and second that it can be verified or challenged.

Certain key issues concerning practice-based knowledge generation are at the heart of the argument to be made here. These are the relationship between research, knowledge and the artefact, the nature of practitioner knowledge and frameworks for practitioner research in relation to the artefact. In order to explore these issues we draw upon knowledge and experience gained from relevant funded research and PhD programmes in the arts, design and digital media.

In the English-speaking world, the UK, Australia and New Zealand are leading the way in the development of structures for formalizing research that explores knowledge in and from practice, particularly in the art, design and digital media domains where the creative artefact assumes a central role. In other countries, including Sweden and the USA, there are new initiatives in practitioner-led research programmes, which have similar characteristics, although the organizational frameworks are less well established at the time of writing. An important influential factor shaping the way these initiatives take root and grow is a country's university system and its regulatory standards, which affect the take-up and expansion of such initiatives.

A number of funded research initiatives have been taken in which collaboration between, for example, science and art have been facilitated. Two examples are the SciArt programme<sup>1</sup> in the UK and Synapse<sup>2</sup> in Australia. In such cases, although the normal outcomes including learned papers are expected, artefacts that are exhibited in some way are also seen as legitimate and valued contributions from the research.

From the point of view of the role of the artefacts in practice-based research, the PhD is particularly interesting because the research process is necessarily of high significance and receives considerable attention by practitioners and supervisors. PhD processes represent models of research processes more comprehensively. In the general research context, it is the outcomes that receive most attention but, by considering PhD programmes, we are able to address issues of research process. For that reason we focus on PhD programmes in practice-based arts research where an artefact plays a significant role. We also consider the organizational contexts that constrain and direct such research and we consider the artefact in relation to the actual research processes.

Awarding PhDs for practice-based research is not often justified solely by the making of works. Research includes the production of some kind of description of what is new, or what has been discovered or created. Practice-based art research can be about the creation of new apprehensions but any art object made as part of that research does not, by itself, embody knowledge. However, the text that accompanies the work may indeed illuminate new apprehensions or a new way of creating apprehensions that we can claim as the new knowledge produced.

It is important to recognize that following the pursuit of a PhD award, and learning how to do research in that sense, is not a necessary requirement for an artist or for any other kind of practitioner. Practice may well be enhanced by research but it need not depend on research skills. Most probably we go to dentists, doctors and solicitors who do not have PhDs. We enjoy poems, music and paintings without needing to check for PhD qualifications. For the artist, research can enhance practice or illuminate it but

it is far from obvious that all creative practitioners can benefit equally. We need to be aware of how the nature of an artist's practice influences the likelihood of doctoral-style research having value.

From the wide spectrum of possibilities consider two kinds of artist: the first systematically explores and reflects upon alternative paths, processes, structures and materials as an integral part of his or her practice; the second develops an outstanding facility with a chosen medium and spends a lifetime applying it. For the first case, it is a relatively small step to work in a way that incorporates formalized research by defining problems, methods and outcomes and, at the same time, produce artefacts that embody the ideas and processes. In any case, the requirement to write text is most often a key issue for a doctorate by research or for the outcome of funded research and that, in itself, may be a natural barrier for some people.

### *Artefacts in practitioner research: domain context*

Research as part of practice is not a new idea, but formal research by creative practitioners has become a part of university life and of doctoral programmes in a small number of countries and in fields where it has proven to be particularly appropriate. The practitioners, whose research provides the grounding for the concepts presented in this chapter, are working primarily within the field of interactive digital art. These artists are at the forefront of an inter-disciplinary movement in which visual and sound artworks, installations and performances are enabling audiences to participate in interactive experiences. The research was undertaken at the Creativity and Cognition Studios<sup>3</sup> associated with a public exhibition space in a major museum where interactive art works are exhibited to the public and audience experience is evaluated.<sup>4</sup> Exhibitions of interactive artworks are mounted, where the works are technically finished but still in need of development in the light of audience experience. In interactive art, the artist is interested in seeing how the interactive elements work. Interactive works invite the audience to explicitly engage with them and, in so doing, participate in the realization of the work itself. Experiencing art is driven by perception, where perception is an active and constructive process. Experiencing interactive artworks involves the same condition in addition to active engagement with the work, which involves being in the space of the work, interacting with it and constructing an experience through this interaction. The domain of interactive digital art faces the particular problem for the practitioner of understanding how audiences engage with specific works. This implies that practice has research problems associated with it and so the domain is especially appropriate in our context.

Bolt (2006) points out that theorizing out of practice is very different from applying theory to practice. Both can form part of a practice-based research project but it is important to be clear how each (theory and practice) can lead to developments in the other. Sullivan (2005) discusses art practice as research and identifies one context that frames the concerns of this chapter. He calls it 'making in systems', which he defines in terms of moving 'beyond discipline boundaries and into areas of inquiry that interact and intersect and require new ways to conceptualize forms and structures'. Having closely observed creative practitioners, who might be said to be 'making in systems', undertaking PhD studies over many years, we believe that it is now possible to

describe some general features of the way practitioners undertake their research and, in particular, how they develop conceptual frameworks that inform and guide the making and evaluation of artefacts.

Amongst the practitioner-based researchers referred to in this chapter, the designing, developing and making of artefacts was the central activity in the research process. Through making artefacts, practitioners were able to generate questions and also to explore the answers to those questions through further making. The role of practice in relation to the research began with the generating of questions carried out in two distinct ways: in one, the starting point was to explore the literature of the field and, in parallel, to generate questions relating to practice; in the other, the questions came directly out of the basics of practice without reference to theoretical knowledge, at least in the first instance. The type of artefact includes interactive and tactile art and installations as well as software instruments and performances: For example:

- interactive art systems that explore the role of the system as an agent in facilitating patterns of emergent behaviour;
- interactive virtual musical instruments and a series of concerts which featured music composed specifically for these virtual instruments;
- two processes of creation and exhibition that resulted in two successful artworks, illustrating aspects of collaboration between artist and curator as mediator;
- interactive art installations exemplifying the concept of play using sensors to capture participant movement.

The artefacts that practitioners create are an integral part of practice whether or not there is a formal research process. However, within research, the making process provides opportunities for reflection and evaluation. It is also an opportunity to generate research questions from the exploration that is a normal part of practice.

### *The artefact, research and knowledge*

For a creative practitioner, the object that is made, be it a painting or a novel or a symphony, is normally the main point of the exercise. That artefact is the art, we might say. As we will see, it is a little more complicated than that. For our purpose, a broad view of the meaning of 'artefact' can be taken. It might be an object, such as a table, painting or building. It might exist over time, such as a piece of music or a film. On the other hand, it might be less persistent in time, such as an exhibition or performance. An interactive artwork would also count even though, in some sense, it only exists in relation to the presence and behaviour of its audience. Going further, Goodman, drew an important distinction between what he called notional and non-notional works of art (Goodman 1978). In a novel, for example, he argued that any sequence of letters that corresponds with the original text is a genuine instance of the work. One might say that the essence of the novel is not the book object at all. It is in the 'notional object' that we access through the book. Our use of the word 'artefact' is intended to cover all of these cases.

### *Research and the artefact*

Research may be a purely theoretical activity or it may use artefacts as the object of study or as experimental apparatus. Our concern, however, is with cases where the production or design of an artefact is central to the research process. *Research* is a systematic process that results in new knowledge or new understanding. Certain basic characteristics must apply to research as, for example, identified by Biggs and Büchler (Biggs and Büchler 2008a); as they put it, research must be *disseminated*, *original* and *contextualized*. Thus the new knowledge or understanding must be in a form that can be shared. It must be shown to be new (in the world rather than to the researcher) and the intellectual context within which it sits must be identified. For brevity we will take understanding to be a form of knowledge. The implications are that we expect new knowledge to be disseminated in a form that enables it to be verified or challenged within its context. For research to be considered worthy of a doctoral thesis or publication in a learned journal, for example, it must contain knowledge that is new, in the world, that can be shared with others and that can be challenged, tested or evaluated in some way. Accepting that much of what we know is known tentatively rather than absolutely, the properties of shared knowledge that can be challenged are more important in research than the absolute certain truth of the new knowledge.

Beyond knowing what is and knowing what causes what (*knowing that*), there is knowledge about action (*knowing how*), for example about how best to make a cake. Through research we are clearly able to find new knowledge about how to better achieve some end. ‘Knowledge how’ may not, however, provide the degree of explanation that ‘knowledge that’ does. The action researcher might generate new knowledge about how to do something but leave it open to others to discover why it works. A phenomenologist might argue that this kind of ‘knowing how’ must precede the related ‘knowing that’. From that point of view, action research<sup>5</sup> should come before experimental research.<sup>6</sup> Until the action research is complete, it could be argued, we do not know what to study experimentally. If we were starting from a clean sheet of zero knowledge, perhaps that would be true, but reality is more complex. However, the concerns of this chapter are with forms of research that involve or are based on practice and so contain a non-trivial element of ‘knowing how’. In such cases, the production of an *artefact* is often central to the investigation and is a key distinguishing feature.

### *Knowledge and the artefact*

Scrivener’s paper ‘The art object does not embody a form of knowledge’ argues against the notion of art research, for example towards a PhD, in the conventional model. He is against a course of research that includes the generation of new knowledge in the traditional sense because, he contends, art is not concerned with communicating knowledge based on a justification of that knowledge. Artworks offer perspectives or ways of seeing: art is made in order to create what he terms ‘apprehensions’ (Scrivener 2002). Scrivener has suggested a way forward that resolves this problem. He proposes that, in effect, ‘new knowledge’ can be understood within the context of any particular discipline by reference to the norms and tests employed in that discipline. Even between traditional disciplines, such as experimental physics and historiography, different

norms and tests are used. He argues that arts-based research inevitably has its own standards and that they must be used in understanding the nature of the research being conducted (Scrivener 2009a). From this point of view, we can see that ‘verification’, for example, applies in all research but the ways in which it is conducted might vary widely according to the domain specific norms. This raises the need to ensure that, when research results are communicated, the relevant norms and tests are made explicit. Thus, the use and presumed context of the word ‘knowledge’, for example in the sense of ‘knowledge how’ or ‘knowledge that’, needs to be carefully articulated in any report on practice-based research.

As Biggs argues, the artwork, and hence, the apprehensions, only exist within a context (Biggs 2003). The artwork alone, without text, cannot be seen as a research outcome. As a minimum, a commentary is needed which frames the context in which the artwork is to be understood, including the research norms and tests. The context is seen to be physical, social or cultural but there is also another aspect to consider. In research, the context of a work needs to include the framing of its perception. We need to know how to look or listen in a very direct sense. We need to know more than which cultural glasses to wear. We need to know what to look at. Then we can see whatever it is that is significant. In other words we need to know how to look so as to experience the apprehensions.

The way that existing artefacts can reveal the development of practitioner knowledge can be illustrated from retrospective studies. In a study of the design of the Lotus bicycle ridden by Chris Boardman at the 1992 Olympic games, the history of the transformation of the bicycle artefact in relation to its predecessors provided insight into how new ideas arise from existing models and how conventions are used, changed and reformulated until a truly innovative concept arises. The artefacts studied provided evidence about the evolution of the designer’s knowledge from the initial learning of craft skills to expert knowledge leading to ground-breaking design (Candy and Edmonds 1994). This kind of study is indicative of how artefacts can play a significant part in generating and embodying new knowledge and hence, can be justifiably included in research. This is the approach, sometimes known as *material culture*<sup>7</sup> that can inform our understanding of the nature of practitioner knowledge retrospectively (Tilley *et al.* 2006).

It is our position that the role of artefacts in material culture studies is entirely different from what happens with practitioner research where making the artefact is a significant part of the research methodology itself. The most common artefacts that form part of arts-based research projects are objects and artworks, designed within the research context, in all kinds of media, from musical performances to paintings and novels. These artefacts may well represent the core of the ‘new knowledge’ generated by the research, but the clarity with which that knowledge is communicated directly through the artefact is questionable. Given that one accepts that the artefact can, in some sense, represent new knowledge, the problem of sharing it leads to the perceived need for text describing the context, as discussed above, before the related work is normally described as ‘research’.

### *Practitioner knowledge*

Practitioner knowledge differs from other forms of knowledge such as that arising from scientific experimentation. The process of generating practitioner knowledge arises from sources that are often unique to the individual and are embedded in tacit understandings that require externalization and these understandings evolve over time as part of the practitioner's everyday creative process. Nevertheless, in research, the highly individualized nature of practitioner knowledge has to be made evident to others and it is in the methods of the practice-based research process that such sharable outcomes become possible. In order to achieve such advances in knowledge, the everyday research process common to professional practice has to be defined and executed in a manner that is commonly agreed. The research component of the practice-based research is, in most respects, similar to any definition of research, a key element of which is the transferability of the understandings reached as a result of the research process.

The type of practice that an artist undertakes is an important consideration in judging whether or not it lends itself to research. Some artists' practice is naturally close to research whilst others work in ways quite distant from research enquiry and sharing. Perhaps the key characteristic required is that the practice is fundamentally exploratory, involving innovation and risk in ways that are familiar to researchers in the broader community.

### **Practitioner frameworks for practice-based research**

All research is conducted within a context of convention and tradition. Within a well established and focused field, such as Number Theory in mathematics, that context is so well understood that it is common to treat an understanding of it as tacitly understood by all involved. In such cases, there is no perceived need to describe the framework within which the work is conducted except in texts aimed at the lay public. In the case of practice-based research, however, there is significant variation between practitioners and, in general, the maturity of the field is such that a shared understanding of context may not be assumed even amongst experts. The existence of practitioner frameworks for practice-based research is, therefore, an important issue to discuss and be explicit about.

### *Frameworks for the research process*

A framework for practice-based research comprises a conceptual structure that is used to influence practice, inform theory and, in particular, shape validation or evaluation (Edmonds and Candy 2010). Such frameworks may be tacit, in the sense that they are implicit but nevertheless implied by the cultural context or personal tradition, or they may be explicit and part of a practitioner's chosen approach.

In the context of research, we can expect the framework to be, or to become, explicit. The sharing of the framework would be one of the normal research activities. A framework may consist of many different things according to the individual practitioner's goals and intentions. Amongst the practitioners referred to here, common

descriptors exist: for example, types, modes, qualities, categories, indices, etc., which may refer to similar concepts. At the same time, the methodologies that are developed have an impact on the way the framework is applied and how it is altered in the light of experience.

Some examples of framework types are:

- classifications for assessing the ways in which audiences respond to particular works;
- criteria for guiding the design of a new artefact or installation;
- questions, expressed as working hypotheses, to be explored using theoretical knowledge.

When practitioners carry out research in parallel with making works, they engage in a process of developing frameworks that guide their practice and the evaluation of the outcomes of that practice: i.e. artefacts that are submitted along with a written text. This is an essential part of the generation of insights and understandings that contribute to the final outcomes and, where a PhD submission is involved, comprise part of the new knowledge.

Practitioner frameworks are defined by whoever invents them (e.g. an artist) and the purpose they serve (e.g. to shape the developing artwork). The practitioners whose work is provided by way of example in this chapter, are working primarily within the field of interactive art systems using forms of digital technology to create experiences for direct audience participation in the creation of visual and sound artworks. These practitioners are engaged in doctoral research that involves a cyclical process of putting theoretical knowledge into practice and revising theory as a result of the outcomes. Theory and practice are intertwined in the development of their art. Research questions and issues come naturally from the practice and it is often a small step to articulate the context and methods associated with practice. There is, in this context, a reflexive relationship between practice and theory as well as evaluation that plays an important role in the practice-based research process. This provides a particular viewpoint from which the works are considered during the process of making and evaluating them.

### *Practitioner frameworks*

We have studied a number of practitioners undertaking doctoral programmes and identified characteristics of their research processes including the development of individual conceptual frameworks. The authors have described examples of different trajectories followed by practitioners and the way in which the frameworks played a central role (Edmonds and Candy 2010).

In the example cases below, practice forms an integral part of the research process. In each case the practitioner has devised a unique framework that is used to guide the making of works and shape evaluation studies of audience experience and engagement with works. The understanding of the use of research frameworks has advanced significantly over the last quarter of a century.



*A framework for interactive emergent experience*

Jennifer Seevinck is a visual artist who is exploring how her artworks can stimulate emergent experience in audiences. By emergence is meant the appearance (to the viewer) of new forms not explicit in the source work. As an artist, Jen is continually making artefacts and for her, as with other practitioners, no research process begins without the prior existence of such works that may or may not be included in the ongoing research process.

An analysis of Jen's research process indicated that as she creates artworks she addresses questions as to whether or not they fulfil her expectations with regard to the audience or viewer. Underlying this is a stream of enquiry about emergence and how audience response is influenced by interaction with artworks. Separately, from an analysis of the theoretical literature of emergence, she derived a set of categories of properties for describing the compositions and shapes observed in audience interaction. Having derived this first framework, she then evaluated her existing artworks. These works had been designed to stimulate emergent responses in audiences according to a working hypothesis. The qualities of emergence were structured according to origin (e.g. perceptual and physical) and intrinsic and extrinsic structures (e.g. the emergent part changes or does not change the source). The results of the evaluation studies and the refined framework were used to inform and guide the making of the next work. Here the framework both informs the art making process and also provides a means of interpreting the results of observing audience response and behaviour through evaluation (Seevinck and Edmonds 2008).

*A framework for interaction with virtual musical instruments*

Andrew Johnston is a musician and programmer investigating the design and use of software to support an exploratory approach to live music-making. The resulting audio-visual performance work for trombone and 'virtual musical instruments', *Partial Reflections*, co-created with Ben Marks, was premièred at the Sydney Opera House Studio in 2006.

An analysis of Andrew's research process indicates that making works is the main driver of the research. He designed and implemented software (virtual instruments) that allows musicians to 'play' using the sound of their familiar acoustic instruments. The criteria generated from a documented reflective practice were used to guide the next iteration of the design of new works and were intended to achieve qualities in the instruments that would have particular effects: for example, the instruments would have attributes that were natural, consistent, interesting and motivating from a player's point of view. Once the virtual instruments were at a stage when they could be confidently handed over to other musicians, it was then possible to carry out a user experience study in which the instruments were evaluated against the initial criteria. The study examined what happened when the instruments were played in real practice and whether the criteria were satisfied. Based on results from the study, the criteria were refined and extended. Finally, a new conceptual framework for interpreting user interaction was derived. The framework and details of the studies that were undertaken can be found in Johnston, Candy and Edmonds (Johnston *et al.* 2008).

*A framework for collaborative curatorial practice*

Lizzie Muller is a curator, writer and researcher specializing in interaction, audience experience and interdisciplinary collaboration. Lizzie has developed an ‘experiential’ approach to her role as a curator of interactive art and in her PhD research sought to develop this as part of collaborative practice with selected artists.

An analysis of her practice and research processes showed that, although theory driven in many respects, it is distinguished by a strong reflexive relationship between theory and practice. This example provides insight into a practitioner researcher’s approach that combines theory with practice in curatorial experience in a dynamic reflexive relationship. Theoretical knowledge drawn from the field of Human Computer Interaction was adapted for use in an artistic context and used to derive a framework consisting of tools and methods for understanding audience experience. The framework was then applied to two case studies of artists’ developing and exhibiting their work in a public space and the results analysed. From the results of applying the tools and methods to the case studies of the collaboration between the curator practitioner and two artists, the practitioner was able to refine her understanding and generate a refined critical framework consisting of a set of qualities of audience experience. The revised framework was used by the practitioner for further curatorial activities and was found effective for interpreting the nature of the interactive artworks including the artist’s response to the audience experience (Muller 2008).

*A framework for interactive play experience*

The fourth example combines art practice and qualitative research methods in a cyclical process of artefact creation and evaluation. Brigid Costello is a practising multimedia artist with expertise in interaction design, programming and visual design. Brigid has developed ways to enable playful experiences for audiences when interacting with her artworks.

The practice and research process identified here involved several stages of creation and evaluation, from formulating the main research question and generating design strategies that were tested with existing artefacts, to the creation of new works using the tested (and modified) strategies. It began with the creation of a number of interactive works that enabled her to explore audience experience using criteria for design to shape her works so that they engendered or encouraged play. From an exploration of theoretical literature about play and related phenomena, she developed a framework of play based on thirteen pleasure categories. The artworks created using the modified criteria were studied using the framework to support the evaluation of observational data gathered from audience experience studies. From the results of the audience studies, new understandings about the capability of interactive works for play experience were derived and the framework was refined. A relationship between the refined criteria and the final version of the framework was established. The ‘play framework’ of thirteen pleasure categories provides a structure both for creation and evaluation of works (Costello 2007; Costello and Edmonds 2007).

## Trajectories of practice and research

In the examples described above, each practitioner devised an individual framework that was used to guide the making of works and shape the evaluation studies of audience experience. Practitioner frameworks of these kinds are constructs that evolve through their role in guiding creation, evaluation and reflection on practice. The processes whereby practice, theory and evaluation contribute to the development of the frameworks extend over significant time frames, and in relation to extended series of artworks. Those processes occupy a space of possible pathways in which the practitioner activities move between pure practice and pure research. The paths taken in this space of possibilities are here termed 'trajectories'.

In a *trajectory of practice and research*, there are three elements: practice, theory and evaluation. Each element involves activities undertaken by the practitioner in the process of making physical works, developing conceptual frameworks and performing evaluation studies. Trajectories of practice and research can work in a number of different ways. Where the primary driver is theory, a framework is developed that draws on theoretical knowledge and is used to shape the evaluation process and the creation of works. A second type of trajectory is one where the practice drives the development of theory. In this case, research questions and design criteria are derived through the creation of works and this leads to the development of a theoretical framework which is used in the evaluation of the results of practice. In both cases, the process is cyclical and there is often a tighter iterative sub-process in which the framework and practice develop together.

The trajectory of practice and research, whilst a time-ordered path, is far from a linear, step-wise set of activities that moves inexorably towards an intended goal. In reality, even under the time constraints of a research programme, the practice is interwoven with the other two elements: theory and evaluation. Sometimes the theory comes first but often, the need for it emerges as the practice process continues. The role of theory and practice in creative arts research is relatively familiar but that of evaluation, as we characterize it, is perhaps less well known and can be seen as representing a novel approach in this field. The nature and role of evaluation and the associated theory and practice is presented in full in a recent article (Edmonds and Candy 2010).

*Practice* is a primary element in the trajectory providing as it does motivation for conducting research as well as generating the activities for creating and exhibiting tangible outcomes such as artworks, exhibitions, installations, musical compositions and creative software systems. In the nature of practice-based research, experiencing these works is usually necessary for a full understanding of the contribution to new understanding (knowledge) that the practitioner is making. For that reason, the role the works play in evaluation is vital.

*Theory*, as it is understood in the context of practice-based research, is likely to consist of different ways of examining, critiquing and applying areas of knowledge that are considered relevant to the individual's practice. If, for example, the practitioner seeks to create a software artefact that can be used in ways analogous with a conventional musical instrument, then being able to select and adapt relevant theoretical knowledge of the physical modelling of sound is a necessary role for such 'theory'. On the other hand, practitioner theory may consist of an untested opinion

(‘hypothesis’) that the artwork can elicit certain emotions or qualities of experience in an audience or ‘user’; this will remain a personal ‘theory-in-action’ until it is subject to a more rigorous form of study that involves investigation as to whether or not the opinion has any truth beyond an individual viewpoint. Amongst practitioners, this is often referred to as design criteria or strategies operating as working theories in the creative process. Within the formal constraints of the doctoral research process, these working theories are developed into more rigorous forms through the exploration of theoretical knowledge and the examples of other practitioners.

*Evaluation* that informs practice has a particular role that is defined by practitioners themselves in order to facilitate reflections on practice and a broader understanding of audience experience of artworks, for example. It usually involves direct observation, monitoring, recording, analysing and reflection as part of a semi-formal approach to generating understandings that go further than informal reflections on personal practice. Whilst the methodology is less prescriptive than that of traditional experimental science, such studies are usually carried out using a variety of tested methods drawn from different disciplines. In the interactive digital arts, the fields of Human-Computer Interaction (HCI), Action Research and Ethnography, for example, are rich sources of inspiration, methods and techniques.

The position presented here with respect to the role of the artefact in the practitioner research process is one that can be related to existing research paradigms such as HCI. It falls, therefore, within what Biggs and Büchler (2008b) refer to as the Situated Position. In the examples described above, the making of the artefact is common to all and its role is critical but there are individual variations within this particular practice-based paradigm. Whilst all the practitioners create their own conceptual frameworks involving creation and evaluation of an artefact, some are more concerned to explore broader theoretical concerns focusing on the framework itself whilst others use the frameworks to obtain evidence that supports the artistic intentions for the artefact itself. Whatever the variations in the approaches are, they are all grounded in existing research methodologies that are developed and modified to address the particular requirements of interactive digital arts. Methodological steps are, therefore, quite often, significant outcomes of such doctoral research.

### **Organizational frameworks for practice-based research**

Research processes, such as those discussed in the previous section, always take place within some intellectual, social or organizational context and those contexts inevitably influence both the details of the research and the practitioner frameworks that are employed. It is important, therefore, to give consideration to relevant organizational frameworks for practice-based research and the central place of the artefact in much of that work.

#### *The artefact and funded research*

When research is funded, the funding rules often place constraints on both the process and its outcomes. In some countries various funding programmes have been developed that support practice-based arts research. Often they involve collaboration

between creative practitioners and other types of researchers, such as scientists. Whilst research papers often arise from these programmes, artefacts as significant outcomes are also common. Examples include the Wellcome Trust's SciArt programme in the UK, which concentrated on art practice that is informed by bio-medical research and the Australian Synapse programme, in which the Australia Council for the Arts and the Australian Research Council jointly fund artist and scientist collaborations. The Norwegian Artistic Fellowship programme (Chapter 2), is another example of funding for research involving practice.

In the UK, the Arts and Humanities Research Council (AHRC) has provided a careful definition of what it regards as research and has given particular attention to what it terms 'practice-led' research. For the purposes of this article we continue to use the term 'practice-based'. In general, the AHRC defines research in relation to process and does so in terms of what a description of research must contain. Three key elements are listed: questions or issues, context and methods (AHRC 2009: 66). They specifically state that creative outputs or practice can be included but are careful to delineate the cases that would count as research as against pure practice and require documentation of the research process and a textual analysis or explanation that demonstrates critical reflection. This last point is probably important to AHRC so as to distinguish its funding from those of the various arts funding bodies in the UK, such as the Arts Council of England. The need for such distinctions is not uncommon.

In the UK's Research Assessment Exercise (RAE), on the other hand, the definition of research includes 'the invention and generation of ... images, performances, artefacts ... where these lead to new insights' (RAE 2006). This definition would seem to briefly describe the view taken by the AHRC. A difference between the AHRC and RAE is that the latter will not accept teaching materials as evidence of research excellence whereas the AHRC allows curriculum development as an outcome of research. Perhaps the key point is that evidence of new knowledge, or new insight, must be demonstrated at the very least by a textual commentary on any artefact that is claimed to embody that knowledge.

The importance of sharing research is almost always stressed by funding bodies, such as the AHRC. It is assumed that research is cumulative and that the results must therefore be accessible. The AHRC's requirement that researchers identify their research question and that they are explicit in the end about their answer helps to facilitate the cumulative process and makes the development of personal experience and private understanding, for example, fall outside the realm of research, cf. the discussion by Biggs and Büchler (2008b).

The Wellcome Trust has published an evaluation of the SciArt programme which includes reports on its impact on the research funded (Glinowski and Bamford 2009). It shows, for example, that the collaborative research acted as a catalyst for change in artists' practice in a very high percentage of cases. Often, the programme introduced artists to the idea of research as an element of practice. Hence it is interesting to know that the practice was changed as a result. It was primarily the artists who were making artefacts within the programmes and it was the incorporation of that making into research that initiated the changes. The following quotations from artists indicates the range of those changes: it 'provided me with new insights into my work' (Glinowski and Bamford 2009: 60), 'it has influenced the way that I can articulate to myself what it

is that I have been working on' (Glinowski and Bamford 2009: 61) and 'I was interested in the clarity and integrity of the scientific method can give to an artistic outcome' (Glinowski and Bamford 2009: 64).

Beyond direct funding, another form of support for artist researchers is the provision of specific facilities and a dedicated research environment. One such case is Beta\_space, which is an experimental exhibiting space within the Powerhouse Museum Sydney and is a collaborative venture with the Creativity and Cognition Studios at the University of Technology, Sydney (Beta\_space 2009). It is a working environment – a laboratory yielding research outcomes – that benefits both artists and interaction design researchers. It gives participants the opportunity to be creatively involved in the development of new forms of artistic expression, and it gives the general public an insight into the creative process of artists and technologists and the experience of audiences (Muller *et al.* 2006). A key aspect of this working environment is evaluation of the interactive artefacts shown, and every artwork exhibiting in Beta\_space goes through an evaluation process. As in the SciArt case, practice is significantly influenced by this process (Edmonds *et al.* 2009).

### *The artefact and the PhD*

As with funded research, where a PhD is undertaken, university rules have a significant impact on the research process. The examination frameworks developed under the Council for National Academic Awards (CNAA) in the UK, were to prove vital avenues to stimulate and foster a small but strong demand (CNAA, 1988). The criteria set down that allowed for the inclusion of an artefact in a PhD submission have migrated and evolved into the current AHRC guidelines for research. When university regulatory bodies for the award of doctoral qualifications began to allow creative artefacts to be included with a written thesis, the door opened to a new breed of PhDs in which the artefact is a research outcome that forms an essential component of the material presented for examination.

The PhD is awarded to a candidate who, having critically investigated and evaluated an approved topic resulting in an independent and original contribution to knowledge and demonstrated an understanding of research methods appropriate to the chosen field, has presented and defended a thesis, by oral examination, to the satisfaction of the examiners.

(University of Huddersfield 2009: F1.8)

Clearly, the submission of an artefact or a collection of artefacts as part of a PhD has to be treated differently in different cases. In fact, for the most part, it may not be possible to lodge the artefact itself in the University Library as is normally required. The submission is often of sufficiently good documentation of the artefact for the work to be understood in whatever sense is required to meet the PhD requirements. So, recordings of music, films, photographs of paintings, video recordings of performances and so on are likely to be submitted along with the written thesis in a practice-based PhD. The extent of documentation and the degree to which textual descriptions are needed will vary from case to case. Sometimes, examiners are shown the actual artefacts as well as the documentation. Thus an exhibition of paintings, for example, is sometimes staged

for the examination. This does not remove the need for adequate documentation, however, because the PhD must be available for others to study and learn from after the examination is over.

One attempt to classify practice-based PhDs is by Elkins (2005b). He sees the dissertation as something that can inform art practice, be equal to the artwork or even be the artwork. In terms of formal rules along these lines, Glasgow School of Art allows a number of different forms of PhD submission. Of these, ‘portfolio with written commentary’ and ‘joint portfolio and dissertation’ seem to be the two core categories. The former is basically an innovative creative work with an explanation of what is innovative about it and why it is new in the world. The second is partly a conventional thesis but includes, as an essential element, a creative work (GSA 2007). There are two further categories. ‘Portfolio with documentation’ which allows the body of work to be submitted for the PhD in the form of, or together with, documentation. The candidate is not required to explain or discuss any new knowledge in a textual form. A candidate is also allowed to submit a ‘thesis’ on its own in the completely conventional sense. Figure 7.1 shows one way of viewing the Elkins and Glasgow models.

In summary, we identify four models of the PhD outcome:

- a work (artefact)
- a work with commentary
- a work with dissertation
- a thesis

In line with the earlier discussion of the requirements of research, we suggest that only the second and third correctly count as suitable for a practice-based PhD award. It should be noted, however, that this position is not agreed by all universities. For

	<i>Thesis</i>	<i>Dissertation plus portfolio</i>	<i>Portfolio plus commentary</i>	<i>Portfolio plus documentation</i>
History or theory	Practice-led			
Theory complementing practice		Two elements jointly representing research (complementary)		
Art as research		Two elements jointly representing research (unified)		
Dissertation as art				
Practice and exhibition			With a commentary necessary for understanding	Documented artwork

Figure 7.1 A table drawn from Elkins’ models and the Glasgow categories

example, York University's highly regarded Department of Music has awarded PhDs purely on the basis of submitted artefacts (music) for a long time; compare their PhD by composition (York 2009).

In practice, particularly in recent times, text normally plays a part even under the York rules:

while the option to not include text is a possibility, and might be recommended to candidates whose work clearly shows invention, innovation and originality, in recent times this has rarely been advised in the interests of definitive explanations for external examiners or simply because some aspects of, perhaps, less-well-realised-but-still-adequate folios, are not clearly expressed in the work.

(Myatt 2009)

Biggs and Büchler (2008b) have contrasted what they call the *Situated* and the *Isolationist* position. By the former they mean the case where PhD regulations, for example, apply across a university so that a practice-based art or design PhD is situated in a broader academic context. By the latter they mean the case where creative practice has its own rules and so operates outside the standard academic tradition. They see the isolationist position as being unhelpful, resulting in poor scholarship. On this basis, the case for having university rules that allow an artefact alone to be submitted for a PhD is opposed. As has been clear from the earlier arguments, we agree with this position and as our examples suggest, a written text is an important aspect of the approaches described and, indeed, performs a vital function in presenting the practitioner frameworks and studies.

We have primarily drawn upon examples of funded research and PhD programmes conducted in the UK and Australia in order to illuminate our discussion. Similar considerations apply in other countries, such as Brazil and Sweden, for example (Büchler *et al.* 2009a; Büchler *et al.* 2009b). In the USA the practice-based PhD is rarely available, although one notable exception is at Washington University, where the Center for Digital Arts and Experimental Media offers a structured PhD programme that includes a significant practice-based component that follows the UK tradition (DXARTS 2009).

It is interesting to consider the actual situation in terms of the shape and nature of submitted and awarded arts practice-based PhDs. Clements and Scrivener conducted a revealing survey in which it appeared that a majority of UK arts practice-based PhDs did not conform to the requirements of research prescribed by the UK's Arts and Humanities Research Council (Clements and Scrivener 2008). Notwithstanding the fact that rules and recommendations are not always followed to the full, the organizational context defines the landscape within which research processes are developed and implemented.

### Concluding remarks

Research in the arts is frequently about the nature of artefacts or the processes used in their generation. Designing, making or employing artefacts form natural parts of



the research process and sharing the results of the research may be impossible to do without reference to the relevant artefacts. We have seen that some universities and research funding bodies have facilitated this kind of research that includes the artefact in explicit ways. Nevertheless, in large swathes of university regulations, there is no accommodation of the place of the artefact and where it is explicitly ruled out as part of a PhD submission, this can have a significant effect on the way the research is conducted. There is, however, a need for more finessed rules as to what practice-based research is, rather than definitions that are 'isolationist' and hence do not bear comparison with other forms of research.

When considering the artefact within the practice of arts based research programmes, we see the need to consider frameworks that identify the flow of actions and ideas between different aspects of the research process. Different projects will traverse different trajectories and the researcher needs to be clear about their particular path. For this and other reasons discussed above, the outcomes from a practice-based arts research programme are most likely, if not certain, to include both artefact and text that illuminates the context and trajectory of the research, and can, hence, frame our perceptions of the artefact.

The practitioner frameworks that have been described here represent different outcomes from PhD research by creative practitioners. The associated trajectories represent different kinds of relationships between theory, practice and evaluation as exemplified in the four cases. Whilst it is helpful to distil the main elements of the practice-based research process in this way in order to compare and contrast them, it should nevertheless, be pointed out that there are considerable variations in the way the frameworks were developed and applied. In each case, the interplay between practice, theory and evaluation involved many iterations and interaction between the elements as the creative process drove a continuous process of change. The fact that such variation can occur within a highly structured approach to practice-based research that the particular PhD environment demands, is indicative of the way individuality, so important to creative people, can nevertheless be accommodated in appropriately structured formal research. Each practitioner developed a unique appreciative system that was used to guide both research and practice. Because each system arises directly from the process of creating, evaluating and reflecting upon artefacts already inherent in the practitioners' normal practice, there is a strong propensity for carrying it forward into ongoing creative work. Most practitioners expected this to be a long-term outcome of engaging in practice-based research: in this sense, it can be expected to have benefit to practice that extends well beyond formal research.

## Notes

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- 1 Originally set up by the Wellcome Trust in 1996, the SciArt programme was run by a consortium of funders between 1999 and 2002 involving: the Arts Council; the British Council; the Calouste-Gulbenkian Foundation; the National Endowment for Science, Technology and the Arts (NESTA); and the Wellcome Trust. From 2002, the programme was run independently by the Wellcome Trust, at which point it broadened its remit to all art forms (Wellcome 2009).
- 2 The Australia Council for the Arts' Synapse initiative provides opportunities for artists and scientists to work together, and seeks to promote the benefits of such collaborations to the wider

community. By developing awareness and understanding of arts/science practice, Synapse aims to advance the role the arts plays in Australia's innovation system (Synapse 2009).

- 3 <http://www.creativityandcognition.com> (accessed on 6 September 2009).
- 4 <http://www.creativityandcognition.com/betaspace/> (accessed on 18 March 2009).
- 5 Action research is essentially a theory-based approach grounded in real life that, in simplified form, consists of a cyclical process of conducting an investigation, taking action based on the results of that enquiry, followed by evaluation of the improvements in the situation under consideration. Action research requires intervention in order to study impact of change on a given situation and thereby understand the situation under consideration (Hughes 2009).
- 6 Experimental research is a collection of research designs which use manipulation and controlled testing to understand causal processes. Generally one or more variables are manipulated to determine their effect on a dependent variable. The experimental method is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.
- 7 The term 'material culture' is often used by archaeologists as a non-specific way to refer to the artefacts or other concrete things left by past cultures. The study of material culture is concerned with the relationship between persons and things in the past and in the present. It can be contrasted with other cultural forms such as ideas, images, practices, beliefs and language that can be treated as independent from any specific material substance.