Practice-Based Research in the Creative Arts: Foundations and Futures from the Front Line

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ABSTRACT
This article explores the subject of Practice-based Research, its application in the creative arts and its role in generating new forms of knowledge in the context of the PhD. Our aim is to provide more clarity about the nature of Practice-based Research, the approach we advocate and how it contributes to new knowledge that can be shared and scrutinized in a form that is both accessible and rich in its representation of the full scope of creative arts research. We draw on examples spanning over 35 years of experience in supervising inter-disciplinary PhD research programs in the arts, design and digital media.

Introduction

This article explores the subject of Practice-based Research and its role in generating new forms of knowledge in the context of the PhD. Our aim is to provide more clarity about the nature of Practice-based Research, adopting a particular position about how its fits within the discourse on what is both appropriate and acceptable for doctoral level research. In doing so we will bring to bear our experience of research across different traditions as well as extensive experience of PhD supervision from many relevant doctoral programs in the arts, design and digital media [1].

Practice-based research (PbR) is a research approach that has yet to reach a settled status in terms of its definition and discourse despite the fact that it has been present in academic contexts for over 35 years. A basic principle of PbR is that not only is practice embedded in the research process but research questions arise from the process of practice, the answers to which are directed towards enlightening and enhancing practice. The attraction of this form of research for creative practitioners is that by connecting closely to existing practice, it provides a means of exploration that extends that work in a personal sense, as well as contributing to the wider picture. This form of research is usually set in a specific context and yet it must also reach beyond the particular cases, if it is to be perceived as contributing to knowledge in any way. That contribution is fundamental to the value placed on practitioner research by the wider community whether academic, public or private. An emphasis on the contribution of research outcomes to informing practice distinguishes practitioner research from pure or basic research where the aim is to increase our understanding of fundamental principles without regard for utility or application to solving a particular problem. New knowledge about practice, that informs practice, may at times only be obtainable by adopting a practice-based approach.

Practice-Based Research Defined and Differentiated

The use of the term 'Practice-based Research' has become widespread in creative arts research but it has yet to be characterized in a way that is agreed across the variety of disciplines where it is in use. There are differences in uses of the term between those fields where it is most often found. In design research, for example, the emphasis is on understanding the nature of practice and how to improve it, rather than creating and reflecting on new artifacts. By contrast, in the creative arts, including new media arts, the emphasis is on creative process and the works that are generated: here, the artifact plays a vital part in the new understandings about practice that arise. In this sense, practice and research together operate in such a way as to generate new knowledge that can be shared and scrutinized.

Stated simply, *Practice based Research* (PbR) is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. Naturally this definition requires a closer interrogation of the terms and the underlying

assumptions. One assumption that informs the perspective of the authors is that the research and the practice operate as inter-dependent and complementary processes. Moreover, 'research' and 'practice' are different and to use the terms in ways that suggest they are interchangeable is ill-advised: for example in phrases such as 'research as practice" or "practice as research" where the danger of conflating the two activities leads to misconceptions about both and gives rise to much misunderstanding about what Practice based Research really is. In our view this confusion has led to a diminution of the significance of the practice-based approach to the PhD.

In order to understand the special relationship between the two streams of research and practice within the PbR process, it is important first to make explicit the attributes of research as well as those of practice. From there, having drawn clear lines between them, we can then consider how they work together. This kind of clarity is a necessary forerunner to describing how research and practice operate in such a way as to generate new knowledge that can be shared and scrutinized. Let us first take the question of what is practice and relate it to notions of research.

Practice: There are of course multiple meanings of the word 'practice'. A simple definition is something like 'the actual application or use of an idea, belief, or method, as opposed to theories relating to it'. Note the contrast with 'theory' and the emphasis on the use or application of ideas and methods. The word is also use to describe an activity that we do often (e.g. piano practice) or in the case of an activity we are professionally engaged in, goes on throughout our lives (e.g. medical practice). In art and design, practice is often qualified by adding 'art' or artistic' or 'design' and suggests something more than a past-time but rather an activity that is a life-long, a pursuit in which we express our creative instincts and desires. Above all 'practice' connotes *doing* something that extends beyond everyday acts of thinking into actions that may lead to new outcomes. Thus one's 'practice' involves taking those ideas further by realizing them in some way. This could take many forms, from designing food packaging or making an artwork in paper, in wood or steel, to creating new dance moves or writing poems or travel journals.

In professional and academic life, practice and in particular ‘creative practice’ combines the act of creating something novel with the necessary processes and techniques belonging to a given field, whether art, music, design, engineering or science. In the life of an individual person, it involves conceiving ideas and realizing them in some form as artifacts, musical compositions, designs or performances. Practice that is creative is not only characterized by a focus on creating something new, but also by the way that the making process itself leads to a transformation in the ideas, which in turn leads to new works. This form of practice does not necessarily require repeated effort to make perfect, in that sense of the word, although to achieve anything truly novel usually requires considerable effort over many years.

Research: Research, put simply, is a systematic investigation in order to establish facts, test theories and reach new knowledge or new understandings. Other characteristics must also apply as, for example, identified by Biggs and Büchler [2]; as they put it, research must be disseminated, original and contextualized. Most important, however, is to distinguish between research as a 'public' activity that results in generally available outcomes and personal research, which is a private matter. In art and design, many practitioners would say they do ‘research’ as a necessary part of their everyday practice. As the published records of creative practitioners demonstrate, searching for new methods and techniques for realizing ideas is a substantial part of everyday practice and is, for the most part, directed towards the individual’s personal research goals rather than seeking to add to knowledge in a more general sense.

Research involves seeking knowledge where it did not exist before and is frequently used to denote both a process and a product: the process of seeking out new knowledge and the knowledge itself. For something to be perceived as public research, as distinct from gathering

information of personal value, we expect it to produce something insightful, useful or indeed, ground breaking. Research of this kind offers the prospect of achieving something new in the world and both its outcomes and methodology are expected to be available to anyone wishing to scrutinize or challenge it. The results of research are shared, as are the arguments and evidence used to arrive at those results. Scrivener argues that PbR generates culturally novel apprehensions that are not just novel to the creator or individual observers of an artifact [3].

Research that makes a broader contribution to knowledge, rather than personal research that benefits only the individual is fundamental to the approach advocated in this article. Research is not the same as practice and must be differentiated clearly if it is to have any meaning. We believe that by conflating research and practice, this leads to insufficient emphasis on scrutinizing and sharing any claims of originality and diminishes any claims to new knowledge.

Different Approaches to Practice related Research

There are multiple dimensions and interpretations of practice related research and those differences are reflected in small but significant terminological variants. Already mentioned is the concept of 'research as practice' and 'practice as research' which unhelpfully conflate the two:

> *Practice as research "involves a research project in which practice is a key method of inquiry and where... a practice ...is submitted as substantial evidence of a research enquiry [4].*

Another variant is that of Smith and Dean who propose a model of creative arts and research processes: an iterative cycle of practice-led research and research-led practice, intended to be a representation of practitioner processes. The stages within each large cycle of activities (ideas generation, investigation etc.) involve many iterations during which the practitioner makes choices as to which results from the task in hand are useful or which are best discarded [5].

In our experience, we have found a variant of PbR that distinguishes ' practice-***led*** research' from practice-***based*** research to be helpful in certain cases. That distinction can be summed up as follows:

- If a creative artifact is the basis of the contribution to knowledge, the research is practice-*based*.
- If the research leads primarily to new understandings about practice, it is practice-led.

This differentiation is especially useful where the creation of artifacts materially affects the way the process is carried out and the kinds of outcomes that emerge [6]. For practice-based researchers, making an artifact is pivotal and the insights from making, reflecting and evaluating may be fed back directly into the artifact itself. Practice-led research, on the other hand, does not depend upon the creation of an artifact but is, nevertheless, founded in practice. It can refer to a situation where a curator, seeking to understand how to develop better approaches to creating exhibitions, carries out studies into the nature of that practice and identifies the relative effectiveness of existing approaches from which new practice is developed. The outcomes may be shared in the form of principles, models, frameworks and guidelines. See Candy [7] for discussion and examples of this difference in PhD research.

In exploring the different perspectives on PbR exemplified in the writings of, for example: Gray, C. & Malins, J. [8], Macleod and Holdridge, [9] Barrett and Bolt, [10] Sullivan, [11] Biggs and Karlsson,[12], it soon becomes very apparent how little these contribute to a cohesive and integrated discourse of the place of PbR in PhD programs. This is we believe one of the reasons why it has yet to gain acceptance in mainstream academic research.

Practice-Based Research and the PhD

A Practice-Based PhD is distinguishable from other kinds of PhD because the creative works arising from the research process are included in the submission. A full understanding of the significance and context of the research can only be obtained by experience of the works created as distinguished from using them as illustrations. To see the distinction, consider the following case. In a PhD thesis that is about three-dimensional geometry, for example, a structure may be fully defined and discussed in terms of the formulae that represent it. However, it may help the reader to understand the mathematics if a video of an object rotating in space is made available. In this case the video is a helpful illustration but is not an absolute requirement. If, on the other hand, the research is in the art domain and the way that we perceive the artifact is of central concern, then there may be no alternative to providing that video. The role of artifact as art object is not *illustrating* anything but rather is a subject of interest *in itself.* In this case, the text illuminates the artifact rather than the artifact illuminating the text as in the geometry example of a rotating object.

To be able to achieve a full appreciation of the creative works themselves, PhD examiners need to have access to a form that conveys as near as possible a genuine sense of the experience of the works. Musical compositions, digital artifacts, software art, video art, dance performances and installations are the basis of any claims of originality and contribution to knowledge and whilst it is demonstrably difficult to achieve a truly complete experience in every case, given the nature of art experience, it is important that access to the closest realization of the work is provided; typically, this is achieved by viewing exhibitions of works and live performances, and where that is not possible recordings of music, films, photographs of paintings etc. The submission of an artifact or a collection of artifacts as part of a PhD has to be treated differently in different cases. In fact, it may not be possible to lodge the artifact itself in the university library as is normally required and in these cases, the submission of sufficiently good documentation for the complete work to be fully understood is necessary to meet the PhD requirements.

That said, the creative works cannot be expected to speak for themselves in the context of a PhD submission. For that reason they should, indeed *must*, be accompanied by some form of textual analysis or explanation to support its position and to demonstrate critical reflection. A written thesis arising from a practice-based research process is expected to show evidence of original scholarship and to contain material that can be published or exhibited publicly. As such it is a vital part of the research outcomes and cannot be viewed simply as an optional extra. The role of the written thesis is to share the understandings achieved through the research and to achieve that it is important to have a clear structure that sets out the aims, background, methods and outcomes of the research. This is where the candidate shows how the work relates to the state of the art in the field and that it is in some way 'new'. They also have to facilitate an understanding of just what the knowledge is, for example by explaining how to approach or view the new creative work. This means that practice-based doctoral submissions must include a substantial contextualization of the creative work, by way of a 'literature' review. This review is a critical appraisal or analysis that not only clarifies the basis of the claim for the originality and location of the work, it also provides the basis for a judgment as to whether general scholarly requirements are met. The role of the creative artifact is explored further in the following section.

In those forms of practice-related research that aim primarily to generate new understandings about the nature of practice itself (i.e. the practice-*led* distinction made earlier), the role of making an artifact is not central to the process. This research usually involves an exploration of existing working practices and through studies and reflections aims to produce new knowledge that has operational significance for that practice, for example, best practice guidelines, exemplar curricular or exhibitions etc. In a doctoral thesis, the results of practice-led research may be fully described in text form without the inclusion of a creative work, although documentation of that work may form an important part of the presentation of the

ideas. Where the primary focus of the research is to advance knowledge about practice, or to advance knowledge within practice, such research includes the 'process of practice' as an integral part of its method.

Making a contribution to the generation of new knowledge is, of course, at the heart of PhD research traditions. Because in Practice-based Research creative works are essential to a full understanding of the claims of new knowledge, it is important at this point to consider the place of artifacts in such research.

The Artifact in Practice-Based Research

The artifacts that practitioners create are an integral part of practice and within PhD research, the making process provides opportunities for exploration, reflection and evaluation. For a practitioner, the object that is made, be it a painting or a novel or a symphony, is normally the main point of the exercise. As we will see, it is a little more complicated than that. For example, the point of the artifact can be to enable an experiment and it can be rather intangible. For our purpose, a broad view of the meaning of 'artifact' 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 behavior of its audience. Goodman, drew an important distinction between what he called notional and non-notional works of art [13]. Notional works of art have many different but equivalent forms. 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, no matter, for example, what font is used. 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 'artifact' is intended to cover all of these cases.

In a practice-based context, the role of artifact is viewed as central to the research process. This raises the question as to how the outcomes of this research can be shared, with the wider world so to speak. Scrivener's paper "The art object does not embody a form of knowledge" argues against the notion of art 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" [3]. 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 and it follows therefore, that arts-based research inevitably has its own standards that must be used in understanding the nature of the research being conducted. This raises the need to ensure that, when research results are communicated, the relevant norms and tests are made explicit. 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 may be physical, social or cultural including the framing of its perception by which is meant that we need signposts that guide us to an understanding of its significant. The practice-based research thesis has a key part to play in guiding that experience.

Research that is of a doctoral standard involves creating something novel and original that can be understood more generally and to achieve that an accompanying text is needed. Friedman provides an expanded explanation of this point in his review of different kinds of PhD, with a particular emphasis writing in an art or design PhD [14]. He says, "While doctoral work in the creative and performing arts and in design may reflect differences from work in other fields, the degrees of variety and difference are not as significant as many authors believe." In particular, an important element of any kind of research is communicating it through writing. His article goes on to offer advice on just how that should be done.

Contributions to New Knowledge and the Practice-Based PhD

Some kinds of new knowledge are derived from empirical studies of audiences and art systems, whilst others are more speculative and exploratory. The outcomes from research in creative practice represent a wide variety of contributions to culture and knowledge. The artworks and interactive art systems stand for themselves of course, but also, in formal practice-based academic research, they are placed in context through written theses and disseminated in published papers. In the view of the authors, making an original contribution to the knowledge of the field is an essential feature of a practice-based PhD. The question that usually arises, however, is what exactly do we mean by an "original contribution", and assuming we can define this, can it include the creation of a novel, previously unknown artifact or work? Let's take the question of what is new knowledge a little further before presenting examples of contributions to from PhDs.

As we have stated previously, it is important to be clear that knowledge that is new for the practitioner alone is not included in any definition of PhD practice-based research. Where this is considered to be acceptable this is, in our view, insufficient for a PhD and calls into question the validity of the submitted work. An important distinction between personal practitioner research and doctoral Practice-based Research is the form that the knowledge generated takes. The practice-based doctoral research outcome that is shared with a wider community arises from a structured process that is defined in university examination regulations. Knowledge arising from Practice-based Research is embedded in a range of outcomes: understandings about audience experience, strategies for designing engaging art systems, taxonomies of emergent behavior and models of collaboration to take a few examples. And of course, there are the works themselves: the artifacts, the compositions, the performances, the exhibitions and installations.

We have argued above that if creating an artifact is an integral part of the PbR process, then sharing the results of the research is near impossible to do without reference to the relevant artifacts. On the other hand, the creative work exists within a context: an artwork alone, without text, cannot be seen as a research outcome. The expression of knowledge and whether or not it is communicable in a generally agreed sense is an important issue when it comes to being able to judge whether or not there is a genuine contribution to knowledge.

The nature of the particular form used to ‘transmit’ knowledge is an important issue. Some argue for conducting empirical studies, the results of which are readily expressed in linguistic or numerical forms by way of explanation. This ‘evidence’ can be understood unambiguously, it is argued, whereas an artifact cannot stand on its own without an explanation of context. In many ways, this is fundamental to the whole question of the role of the artifact in research and knowledge generation. If the import of a painting has to be explained in words, it assumes that the viewer does not have access to the ‘language’ of painting. However, not everyone can read mathematical proofs and yet these are considered to be sufficient explanations for those who do. If enough people know the language of painting to understand what the creator is claiming to be new, why is there a need for linguistic explanation as well? The “language of painting” cannot be said to be a clear universally agreed one. The use of the word “language” might be seen, for some at least, to be metaphorical.

The question of ambiguity is central to addressing this issue. Explanations expressed in mathematical form use a universal notation that is unambiguous to those that have learnt it. Likewise, musical scores have similar characteristics with, perhaps, more room for interpretation. Without an unambiguous ‘language’ for all artifacts whether visual forms or interactive installations, there is room for multiple responses and interpretations. That ambiguity is after all fundamental to the nature of art and its complex relationship to our capacity for appreciation. There is, therefore, clearly a tension between having a shared

experience of creative works and communicating the understandings that arise in a form that meets the requirements of shared knowledge as exemplified in a PhD submission.

The role of the artifact in research is a contentious aspect of the Practice-based Research debate. Practitioner research may use artifacts as the object of study or as experimental apparatus and in many cases the creation of an artifact may well represent the core of the new knowledge generated by the research. However, whether that knowledge can be communicated unambiguously directly through the artifact is questionable. Whilst art in itself is not directly concerned with 'communication', research that involves an artifact may produce claims for new understandings that require some form of 'justification'. If we accept that the artifact can, in some sense, represent new knowledge, the problem of sharing that knowledge implies a need for a parallel means of communication, in effect, a linguistic one that can help to frame the way that we view the artifact and grasp the knowledge.

Example Contributions to Knowledge from PhD Research 1980-2015

The following discussion presents a set of examples of contributions made in practice-based PhDs supervised by Edmonds over a wide range of years. They are not chosen to be fully representative but as examples known well by the authors and for which they can clearly vouch. The discussion is organized over time, with the earliest examples presented first. Thus, an evolution may be observed, as the detailed understanding of the practice-based PhD has been refined.

Stephen Scrivener's PhD research [15] investigated graphical programming languages that might be used by visual artists. In particular, he explored the potential of what at the time were the new pixel-based computer graphics and its potential for providing the flexible ways of working that he identifies as typical in art practice. His contribution centered on the implementation and demonstration of an entirely new programming language: one that enabled the user to describe images and, most significantly, to manipulate them with great flexibility. The research process depended both on theoretical work and on actually working with digital images to explore the ideas. In fact a new computer graphics system was built in order to enable the practice element of the research to take place. Whilst much of the argument of the thesis could be, and was, described in words it was difficult to grasp the full novelty of the work without seeing the language in action. Therefore, the presentation of the work for examination had to include a demonstration of the software at work. An interesting observation is that today it is likely that an informed reader would understand the new knowledge from reading the text, so the context of current knowledge and expectation might be a factor in the degree to which the presentation of an artifact, as well as a thesis, is necessary.

Later, Susan Tebby [16] carried out research into the use of various formal procedures and patterns in making art. This was very much a research process that was conducted through drawing and making, exploring the implications for her art of the systems under investigation. Without realizing the artworks it was not possible to grasp these implications. In this case, the role of practice was both central and unavoidable. For example, one discovery concerned the way in which errors in implementing a procedure could lead to valuable aesthetic outcomes. The research conducted in this area could not have been done without the act of drawing being conducted and the 'error' being made. The submission of the PhD consisted of a thesis together with an exhibition of the artworks generated during and through the research. The examiners spent a significant amount of time in the exhibition, which illuminated the understandings that they had obtained from reading the text. The exhibition was fully documented and a full set of 35mm slides (the medium of the day) lodged in the library with the text.

Stephen Bell's PhD [17] fell in the next wave in that it investigated the use of particular algorithms, implemented in software, to generate new art forms. The research process, beyond

the state of the art review and certain theoretical investigations, consisted of an iterative process of making (writing computer code), looking (evaluating) and revising. The writing of code was, of-course, quite an objective process in which algorithms that were postulated to be interesting were implemented. The evaluation, on the other hand, was entirely subjective. Although others were asked from time to time the central figure in the evaluation process was the artist himself, Stephen Bell. It was through this making and evaluating process, the artist's practice, that new understandings about the particular class of algorithms being used was obtained. Again, the results were described in words in the thesis but to properly understand the contribution to time-based and interactive art it was necessary to see the results in action and not just to read a description on a static page.

Moving forward in time to the 2000s, Dave Burraston's PhD explored the use of particular formal systems, cellular automata, to generate music [18]. This work was a classic blend of theory and practice both in its execution and in its results. Cellular automata were investigated formally and new theoretical results produced. At the same time, the automata and the new results were used in a variety of ways to make new music. The theory in many ways drove the practice but the practice also brought out clearer theoretical questions to be investigated. The way in which the automata were employed made a new contribution to knowledge in this context but that absolutely depended on hearing the results and confirming that they were interesting, in some sense, as music. What was required was both the presentation of the sound, which was done by submitting a CD, and by providing a description of how that music might be apprehended so as to confirm the findings.

By the time that Andrew Johnston conducted his PhD the potential for more explicit evaluation within the Practice-based Research had become clearer [19]. This work investigated the potential of interactive audio/visual computer systems in performances by musicians playing conventional instruments, such as trombones. This research had, as a major component, the investigation of new art forms but also looked at how those forms might be used in practice by musicians. Obviously, the practice of devising and developing the interactive systems was central to the work. It was through the making that much of the understandings emerged. Indeed, the research goals and opportunities were only discovered out of practice. The evaluation element came about in trying to see what the implications were for the performing musicians and that was done by observing and discussing their practice in the context of these new forms. So this was a multi-faceted example of Practice-based Research that led to both the realization of new art forms and to theoretical results relating to their use in performance.

Jen Seevinck's PhD research also investigated new art forms in a theoretical context [20]. The theory that she investigated was emergence, a subject that is touched upon in many of the examples given in this section. In this case, however, the idea was to see if emergence could be a central aspect of an interactive computer-based artwork. By its very nature, emergence is something that comes out of actions unexpectedly. It hardly lends itself to investigation by contemplation but, rather, demands investigation through action, through practice. As with Burraston and Johnston, theory informed practice and practice led to theoretical work. The central results were embodied in artworks that facilitated and encouraged emergent thinking in members of the participating audience. It was necessary to demonstrate that this was, in fact, the case and so, as well as delivering the results of the research in both text and documented artifact forms, the results of evaluations of participant responses were reported. Thus the argument that what was claimed was indeed justified was supported by evidence gathered in a relatively conventional way. This is an example of practice-based research in which art making is central but in which evidence based conclusions are provided.

Conclusions

In the cases described above we can see that Practice-based Research has particular characteristics that do not conform to traditional norms about research, new knowledge and

how it is generated. The practice that is so central is primarily directed towards making artifacts, whether they are visual or sound objects, installations or performances, which provide the basis of the research. Nevertheless, it is equally important to recognize that PbR includes research and not practice alone. This means that reporting the research in a PhD submission, requires a written thesis which might well include a description of how a submitted artifact should be apprehended, as well as other evidence that demonstrates that the results are new, not just to the practitioner researcher, but to the wider world.

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