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# Understanding experimentation as improvisation in arts research

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## Abstract

**Purpose** – The purpose of this paper is to address the following questions: in what sense does experimentation as improvisation lead to methodological innovation? What are the implications of artistic experimentation as improvisation for education and learning?

**Design/methodology/approach** – The paper tracks the known concept within research of “experimentation” with a view to revealing how practice-led research in art works distinctively with experimentation. It proposes experimentation as improvisation drawing on a research project Sounding Drawing 2012 as an example. The paper situates art experimentation as improvisation in art (Cage, 1995) anthropology (Hallam and Ingold, 2007; Bateson, 1989) and the theoretical work of Arnheim (1986) on forms of cognition.

**Findings** – Arts research as improvisation is participatory, relational and performative retaining the research subject in its life context. The artist as researcher starts with open-ended critical questions for which there are no known methods or immediate answer. By setting up boundary conditions from the outset and understanding the situatedness and contingencies of those conditions, the artist as improviser seeks ways of not only avoiding chaos and the arbitrary but also being trapped by what is already known.

**Originality/value** – This approach is important within and beyond the arts because it consciously draws together different forms of cognition – intuition and relational knowledge and also sequential knowledge. It is also significant because it offers a different epistemology in which new knowledge emerges in the relationship between participants in the research taking form in co-creation. These qualities all position improvisation as a research paradigm and a counterpoint to positivism.

**Keywords** *Improvisation, Art experimentation, Arts research, Experiential knowledge*

**Paper type** Research paper

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## Introduction

The paper tracks the known concept within research of “experimentation” with a view to revealing how practice-led research in art works distinctively with experimentation. There are profound differences across disciplines around what to expect from experimentation and from research. The authors explore a possible way of imagining experimentation in art as improvisation through an example of artistic research – Sounding Drawing (Douglas and Coessens, 2012a). We ask – in what sense does experimentation as improvisation lead to methodological innovation? What are the

implications of artistic experimentation as improvisation for education and learning?

First we will explore Sounding Drawing as an example of artistic experimentation as improvisation, and then analyse this example within a wider framework of thinking on experimentation in research and improvisation studies. We conclude with some insights into the innovative contribution that this approach may make to epistemology and methodology in qualitative research studies alongside reflecting upon its value in teaching and learning.

### **Artistic experimentation: Sounding Drawing (2012)**

Sounding Drawing (2012) formed part of a larger research project, Time of the Clock, Time of Encounter (TCTE) (2012-2013) that investigated how experiences of time might open up new understandings of community. Johan Siebers, philosopher and principal investigator, proposed that time could offer a different way to imagine community as a process of encounter rather than a category of society. The “time of encounter”/“time of the clock” challenged the more familiar constructs of community defined by geographical location, belief or shared culture. The research task was to generate experiences and reflect on what communities of time and encounter could be.

The artists and researchers drew on knowledge within the practices of the visual arts and music, both of which work with time in particular ways. Sounding Drawing emerged as an open-ended experiment and as a collaboration led by Anne Douglas and Kathleen Coessens. It brought together artists and audiences in an encounter with two sensory domains: sound and the visual. The experiment developed in the context of Woodend Barn, Banchory, a multi arts centre in NE Scotland, its communities of interest and audiences for sound, Scotland’s festival of contemporary music that Woodend Barn hosts annually.

#### ***Framing values and asking questions***

Using Siebers’ provocation as a starting point, the TCTE research team made a number of critical observations about time and experience. First industrialisation frames and enforces standardisation. Epitomised in the clock, representations of such uniformity spatialise time by acting as “a container for events”. In this notion of temporality, we imagine time quantitatively, a thing to spend or waste, to consume. There are implications for quality of experience. Time is incessantly speeding up to the point that “everything has to have been done already: its tense is that of the ‘future perfect’” (Siebers, 2012). We fill time with anticipated objectives and results, living in the next moment, and pressurise ourselves to do this more rapidly/efficiently. This temporality has become normative and is at odds with experiential modes of time as the freedom to move in any direction, to come across the unexpected and to be present in the moment of an experience. The creative energy to vary, extemporise, improvise is often a kind of “breaking away” from the standardised clock time. We assign value to experiential time. Such moments are important, powerful, convivial. They are also increasingly few and far between, a rupture with the domination of clock time.

Sounding Drawing as an experimental response to the challenge of TCTE, started with an open question to see what emerged, arguably expanding rather than decreasing variables.

In this way it opened up potential for ways of knowing. Nonetheless the approach was structured rather than chaotic, procedural rather than opportunistic:

Artistic creativity and, by extension, artistic research focus the possibility of infinite variability within acts of representation and interpretation. If research in general is to deal adequately with human society, it needs to embrace those aspects of knowledge production that deal with human subjectivity and relationships, not as phenomena to be deduced and re-harnessed within human control, but open-endedly, as part of a process of creative construction and interpretation that is relative, specific to context and value-driven (Coessens et al., 2009).

In contrast, experimentation in science is an orderly procedure, which creates controlled conditions in order to verify, refute or establish the validity of an hypothesis. The scientific experiment begins with some idea of what relationships are likely to work. The experimental process sets about reducing variables to create the circumstances in which a set of relations can be reliably replicated.

Sounding Drawing offered a different quality of experimentation in yet another sense. The metaphor of “time as encounter” characterised experience as contingent, as unexpected. An encounter is a kind of swerve in events, according to Althusser (2006, p. 169), that may be infinitesimally small, but nonetheless through time and accumulation, leads to profound change. Encounter embodies a perspective that is absent of cause and effect as is the case in the scientific paradigm. It is an opening up to the possibility that events in the world occur, come into being serendipitously, almost cunningly. What precedes encounter is a void, i.e. not the outcome of a set of causes that create effects or of conceptualization in advance that determines action.

Encounter as an idea for community in the TCTE research constituted a sudden change of direction in the ways that we had become habituated to think about community as a social category regimented through other categorical forms, not least that of clock time. Behind this sudden change in imagination, there accumulated a series of responses that explored in experience the implications of such a metaphor, radically shifting the course and substance of our thought and action. We moved from understanding community as something we could construct, to a new understanding of community as immanent – manifest through shared activity and shared experience.

This metaphor is at odds with the long tradition since the seventeenth century of experimentation in scientific research as an orderly procedure, which creates controlled conditions in order to verify, refute or establish the validity of an hypothesis. As a point of entry into research, encounter, as a metaphor for community, prompted a set of responses in music and in drawing that could not have been anticipated and could not be replicated in precise terms. What did we do?

### ***Setting the boundary conditions***

The first step in the inquiry was to develop common ground and open up the space for research participants to orientate themselves. We approached these boundary conditions by exploring the two media in relation to time.

### ***Time in music***

What could music and drawing tell us about time, experience and community? Music is entirely dependent upon time whereas drawing can be both time based as well as an object:

Out of all the arts, music is the most embedded within time. No time, no music, neither its creation nor its outcome. Its existence depends upon time, upon a process of action and perception which links all “nows” of the performance in an inescapable continuity (Coessens, 2012).

Pace in music is determined in relation to heartbeat that is deemed to have an optimum rate (65-80 beats per minute). In this sense standardised time is embodied. To perform music is in some sense to be in control of hesitation, suspension, rush through the body and the creative imagination.

### ***Time in drawing***

Drawing, in contrast, denotes both the “action” of making a drawing as well as drawing as result or “object”. Drawing as a process unfolds through time leaving a trace – “time thickened with material” as the artist William Kentridge (2012) suggests. However, the traces also become artefacts. We encounter drawings as whole experiences, as images that can be memorised and recalled as a whole (Arnheim, 1986).

“Sounding” and “drawing” denote transitional states. The gerund form of “ing” yields the possibility of a change in any direction. “Sounding” can mean literally to make sound or metaphorically (in the nautical sense of) to probe. Significantly in an element such as water, the context of probing is constantly in flux:

Several of the great discoveries, those at least which have transformed the positive sciences or which have created new ones, have been so many soundings in the depths of pure duration. The more living the reality touched, the deeper was the sounding (Bergson, 1999, pp. 54-55).

The ambiguity in drawing between object and process becomes a being in the making loosely bound within the notion of a single entity, a drawing. This ambiguity is evident in the reflections on drawing by the artist, Guiseppe Penone:

A drawing without worry about style, about the character of the handwriting or the manner of the artist.

A drawing where the action of drawing is the subject of the work, the means indispensable to the idea to the language, to the invention of the image.

A drawing that is not exhausted in the effect of its technique but which suggests a reflection on the world and offers an unexpected vision of reality (Penone, 2007 cited in Maraniello and Watkins, 2009, p. 275).

Out of these preliminary thoughts, Sounding Drawing started to take shape in the form of an intervention, an agreed upon time where personal and collaborative, subjective and objective time would collide in very complex ways. A form emerged for activity that consisted of several linked events, a series of encounters within three interdependent groupings of visual artists, musicians, members of public: an exhibition, a performance

and two public workshops. Following the spirit of encounter, we were concerned that a shared brief that might have the function of a score in music or set of instructions in the visual arts, should lend itself to making new work, stepping outside of our respective comfort zones.

To this end we developed a brief in which the visual artists were invited to produce drawings and the musicians were asked to respond through soundings, not necessarily pieces of music but experimental beginnings. Soundings were time limited to one minute for each drawing. The artists came from two different cultural contexts, Scotland and Belgium. The public working with the artists was invited to draw in response to the soundings of the musicians and also to create soundings in response to drawings of the artists through two separate, but interrelated workshops.

In what sense is this an experimental methodology? The research started with an overarching issue – that of problematizing understandings of community. The critical research question that followed originated in experience, i.e. different notions of time – of the clock, of encounter. The question opened up the possibility of establishing an exploratory process – to further explore time through music and drawing both of which are experiential in nature. We now ask in what sense this experimentation can be considered improvisational?

### **Experimentation as improvisation**

Improvisation commonly means to “make do with the materials to hand” (“improvisation” in *Oxford Dictionary*) or “act on the spur of the moment” (“improvisation” in *Collins Dictionary*). The Latin root of improvisation, *improvisus*, consists of two components: *im*, as “not”, and *provisus*, which stems from *providere* to “foresee”, “to provide” (“improvisation” in *Oxford Dictionary*) – in other words to improvise is not to foresee or choose to foresee and not to reach beyond what is readily available. This initial idea of improvisation can be read into the way in which the participating artists in Sounding Drawing were required to work within a given envelope of time and in response to a set of constraints. These were all given as part of the brief. Participating artists were expected to work within these constraints.

However it is possible to argue that improvisation in this everyday sense of working with what is to hand, could appear to have little to do with experimentation as reaching beyond what is already known, a transcendent quality that is implied in the word “experiment”. Improvisation in the sense above emphasises being present in the moment of an experience. It is not goal orientated in the way we expect from conventional experimentation.

A deeper investigation into experience and experiment reveals how these share the same root in *experire*, meaning “to try out , attempt to”. *Periri* carries an altogether more sinister meaning “to perish”, “to die” and the prefix “ex” indicates a movement out of a location or place (Douglas and Coessens, 2012b). We escape entropy and the status quo by moving out of the constraints of the present situation and its ways of knowing. The musician and philosopher, Gary Peters, aligns improvisation to the idea of escape from what is familiar or already known. The improviser, he argues, needs to work with irony,

aware of his/her situatedness and the contingency of the work, and avoiding becoming trapped in the “communicative community created by it” (Peters, 2009, p. 3). Peters acknowledges “the ready to hand”, contingent and situated nature of experience as an imperative to move out or beyond what is given, to escape entropy. In this sense Peters’ improvisation is close to experimentation in art research.

In Sounding Drawing the brief was arguably a container for what was already known, however tentatively. Many of the participants moved beyond the assumptions of this brief. Donald Urquhart as an established Scottish artist and landscape painter, had explained his aesthetic approach as conceptual, where the material production and making process did not alter an idea determined in advance – or at least as little as possible. Urquhart’s response to the invitation to participate in Sounding Drawing was unexpected – “[...] I wanted to embed the idea of time in a performative aspect into the drawing” (authors’ emphasis). Time for him was the seasonal movement of swifts: the noise of their presence denotes summer, the sudden silence of their leaving denotes winter.

By working collaboratively with the musicians Kathleen Coessens and Ann Eysermans, he performed this presence and absence through a time-based work. He painstakingly drew blocks of tone as discrete figures on a wall of the gallery. At a distance these read as images of swifts in flight. At the opening of the exhibition and accompanied by Coessens and Eysermans’s improvisations on the sounds of swifts (double bass and piano), Urquhart marked the passing of the swifts by gradually painting out his drawings, leaving faint traces of their presence (note to web site).

In other words, the research provoked in Urquhart, a different way of working that might be accounted for as improvisation in Peters’ sense, as avoiding being trapped in cliché and assumption. The dialogue between him and the musicians was open-ended, explored through the material, rather than conceptualised in advance and then made as he had previously worked. By respecting the brief and its boundary conditions/ constraints, Urquhart was able to break through into a new level of creative understanding. The work became co-produced by not one, but three or four sites of production. As a result knowledge was not located in one object but in the relationship between different agencies that completed the work – the visual artist, the two musicians and the audience attending the performance (Plate 1).

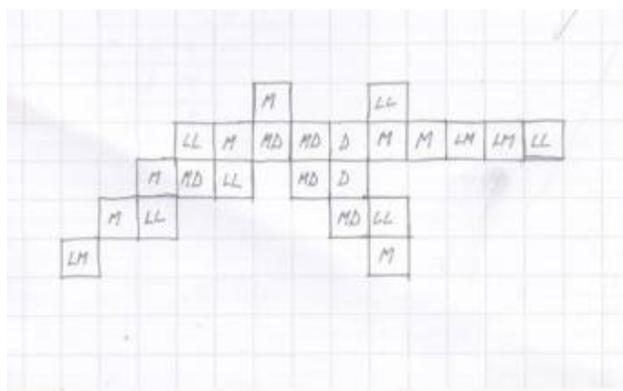


Plate 1.

Donald Urquart “Swifts”, Woodend Barn, Banchory 2012

Source: Photo reproduced with permission from On the Edge Research

In another example, Johan Siebers, participating in the workshops, grappled with the challenge of the task to create drawing in response to sounding:

I did not want to imitate the sounds I heard, to trace them on paper, translating pitch, tone and rhythm to their graphic counterparts of position within the compositional field (high-low, left- right), curvature of the line (scale) and amplitude or change of direction (rhythm), using area and colourite to capture mood – or something like that: an elemental aesthetic of sound to drawing is all too obvious, I felt. I wanted to crack a mystery: how to draw to the sound, in such a way that the incommensurability between them opened up in a space they both share [...] (Siebers, 2012).

Siebers refused to imitate sound in drawing, a default response to the brief. He sensed a conflict in the basic assumptions of the brief. He confronted himself in this new situation and sought a way to a very different outcome by re-orientating himself.

This kind of mobility between an artist or participant and the given constraints, was manifest again and again in the different responses to the project.

### **Mobility in experimentation as improvisation**

If research is a means to understand the world better or more, then both Urquhart and Siebers, like Peters, set about this understanding by orientating themselves in a complex set of relationships, between what is given or determined and what is indeterminate, refusing to be trapped by acting autonomously within acknowledged constraints. Such orientation points to an important quality of ways of knowing and developing knowledge, one that Goethe described some 150 years earlier in the nineteenth century as a principle of observation in the natural sciences:

Insofar as he makes use of his healthy senses, the human being is the greatest and most precise scientific instrument that can exist. And precisely this is the greatest disservice of modern science: that it has divorced the experiment from the human being, and wants to know nature only through that which is shown by instruments- indeed wants to limit and demonstrate Nature’s capacities in this way (Goethe cited in Amrine, 1998, pp. 37-38).

Critical of Newtonian science, Goethe refused the division between art and science – “the greatest disservice of modern science” had been to take the act of inquiry out of human perception. In this way Goethe emphasises the profound relationality of the human observer to what is observed in the desire to know the world better. The observer participates in acts of observation and is changed by them. This is a form of knowledge production that is not imposed upon the world, but yielded from within a changing situation and relationship. It places importance not just on seeing “the thing” but seeing in the context of growth and metamorphosis, remaining as open as possible to the phenomenon for as long as possible. Goethe described this as inner mobility:

Growing consider the plant and see how by gradual phases, Slowly evolved, of forms, rises to blossom and fruit (Metamorphosis of Plants Goethe) (Amrine, 1998, p. 36).

The observer is not passive but mobile, not outside of but part of the context and subject of observation. Each is present to the other and connected to the other through acts of perception. Observation in this sense is relational, performative and participatory:

[...] hence the ideal of the “Goethean” scientist is to remain inwardly mobile through participating in the metamorphosis of the phenomena themselves: “The form is immediately transformed again, and if we wish to achieve a contemplation of nature that is somewhat alive, we must see that we remain as *mobile* and *plastic* as the example nature provides us” (Amrine, 1998, p. 46) (emphasis added).

As the foundation of research and inquiry, Goethe’s approach bears strong parallels with improvisation as a way of being in the world and continually responding and recreating it, thereby completing the whole (Douglas and Coessens, 2012b).

### **Improvisation and experience**

Improvisation is arguably a condition of existence and survival in a similar sense to experimentation:

Each of us has worked by improvisation, discovering the shape of our creation along the way, rather than pursuing a vision already defined (Bateson, 1989, pp. 1-2).

For Bateson, improvisation in culture involves a combination of familiar and unfamiliar components in response to new situations, following an underlying grammar and evolving aesthetic. She argues that improvisation emerges out of living with high levels of ambiguity, of interruption and adaption encountered in experience. This quality of experience in her view is a more creative and more successful and sustainable model for understanding what is going on in everyday life than the more frequently cited model of single-track ambition.

Hallam and Ingold (2007) are also social anthropologists who explore creativity as a form of cultural improvisation, “There is no script for social and cultural life. People have to work it out as they go along. In a word, they have to improvise” (2007, p. 1). They share with Bateson the profound participatory nature of culture as a creative force that is never perfectly repeatable, a world in which the imagination, thought and action meet in specific unforeseen situations (Hallam and Ingold, 2007).

Artistic research, like anthropology, encounters the world in movement. It is grounded in experience. John Dewey expresses this principle in everyday life:

A man does something; he lifts, let us say, a stone. In consequence he undergoes, suffers something: the weight, strain, texture of the thing lifted. The stone is too heavy or too angular, not solid enough; or else the properties undergone show it is fit for the use for which it is intended. The process continues until a mutual adaptation of the self and object emerges and that particular experience comes to a close. [...] (Dewey, 1934, 1980, p. 44).

For Dewey, we are predisposed as living beings to move, to be active and participate in a

world that is unpredictable and uncontrollable. We probe the world through our senses, working with what knowledge we have, effectively experimenting to expand knowledge through experience. Dewey continues by observing that it does not matter what the context for exploration might be, whether the individual is a thinker in his study interacting with ideas, or outdoors lifting stones. We learn by interacting with and experiencing things in the environment. An appropriate research approach therefore for the arts needs to embrace the dynamics of participation, of performativity, of contingency and situatedness that life presents to the inquiring mind.

So let us return to the question we started out with.

### **In what sense does experimentation as improvisation lead to methodological innovation?**

The artist as researcher starts with open-ended critical questions for which there are no known methods. Such freedom allows them to move beyond conventional approaches that anticipate and plan for certain outcomes. Questions arise out of experience and require the researcher to draw out the social, political and aesthetic circumstances that render such questions important. Experimentation as improvisation invites artists and participants to step outside of habitual thinking yet avoids chaos and the arbitrary by setting up boundary conditions from the outset. This situation is not deterministic. It opens up new beginnings to which the researcher needs to adapt. The artist is never fully in control, dependent on the surrounding context in which the participants are also autonomous. New knowledge emerges in the relationship between agencies that take place in the experimentation.

### **What are the implications of artistic experimentation as improvisation for education and learning?**

In his introduction to his exegesis on improvisation, the free jazz improviser Eddie Prévost suggests that his motivation for writing a book about improvisation is the recognition that all procedures, in this case in music, however informal are never free from inherent objectives and power relations – hence his title *No Sound is Innocent*. In the same way we might understand single point perspective as more than a technique of Western drawing, as a practice of hierarchical organisation around a particular perspective within power relations? In terms of ways of knowing, hand single point perspective depended upon a sequential set of moves based within a theory to which all drawing at one time conformed. In the interim drawing has been re-appraised as an intuitive and experiential process – “the opening of form” through a gesture, one that has the inherent capacity of incompleteness (Nancy, 2013, p. 1).

Artistic experimentation recognises knowledge in the arts is dependent upon at least two apparently contradictory forms of cognition. Arnheim (1986) talks about two types of cognition. The first is situated in mathematics, for example where a mathematician follows a method of sequential progression as a means of solving a problem in which each step is accredited by the previous step and leads logically to the next in the chain (p. 23). The second form of cognition is contextual and relational, situated in the way we experience colour, for example –we perceive the colour of an object in relation to its

neighbours (p. 17). Both forms of cognition are complementary and necessary. For Arnheim intellect and intuition bear a complex relation to perception and thinking. These are inseparable (Arnheim, 1986, p. 14). We scan the world through the senses, creating relationships. These field processes offer us knowledge that is physiologically, sensory and cognitively organised. In his example vision takes the form of optical stimuli projected onto many millions of retinal receptors, gathered by the mind into a unified image of various shapes, sizes and colour located in space. There is an interdependence across space and time in which each component finds a relationship to the whole, just as perception of a colour depends on that of its neighbours.

However this field activity and its sensory cognitive base does not allow us to make generalisations. Each time the world can appear differently. We need to be able to generalise to move from one experience to the next, threading what has been perceived in the past into the present, and future. Generalisation is classification based on standardised mental constructs, clearly distinguishable from each other. Arnheim acknowledges these different ways of knowing as “a tug-of-war” between two basic tendencies in cognition: “that of seeing every given situation as a unified whole of interacting forces and that of constituting a world of stable entities whose properties can be known and recognised over time” (Arnheim, 1986, p. 18). While different from each other, these forms of cognition “must co-operate from the beginning and forever” (Arnheim, 1986, p. 19). As in *Sounding Drawing*, time in Arnheim’s construction is an interplay, a dialectic between the two modes of knowing – the sequential and the relational.

Exact replicability in the arts is important in a number of senses and situations. The musician depends upon an accurately tuned musical instrument. The painter depends on the density and stability of colour within the materials of paint. The performer of music or dance needs to memorise bodily patterns to feel secure within a performance. Tuning systems and materials are incidents of many stable repeatable processes in the arts developed through sequential, deductive ways of knowing that originate in the principles of consensus, conformity and verification. However, the arts also require situated, contingent forms of knowledge constructed by making relationships in particular contexts.

In education in general there is a false separation between sequential and relational ways of knowing which lead to the clustering of disciplines around separate categories of the humanities and the sciences, expressed in Snow’s (1964) two cultures rather than, as Arnheim suggests, enabling these two forms of cognition to interact as they do in everyday life.

The ontologies and epistemologies of education and learning practice police the boundaries between epistemologies of science and those of the arts, encouraging a false separation instead of encountering experience as a dynamic too-ing and frow-ing between apparently incommensurable ways of thinking. The arts play between these oppositional forces without diminishing their contradictory dynamism. In music the strict rhythmic beat within music establishes a structure that also needs to accommodate the performers’ hesitations, suspensions and rushes, i.e. the performer’s departures from strict rhythm (Hope, 2012 blog entry). *Sounding Drawing* as experimental research worked with

different, contradictory notions of time.

Improvisation is an incidence of these forms of cognition coming together in an encounter.

## **Conclusion**

This paper began by examining a research project, Sounding Drawing, as an example of experimentation as improvisation. We began with the assumption that unlike science experiments, experimentation as improvisation does not start from a concise hypothesis or theory, but nonetheless starts from the need to research a question or issue for which there may be no known methodology. Both science and arts and humanities research begins by asking – does this process enable me to understand the world better or more? The problem arises when we force a methodology onto a question without considering the ontological, epistemological and ethical assumptions underlying a particular course of action. In other words, it is possible to understand experience through theory but it could be problematic to apply theory to experience.

Improvisation offers a way of engaging in forms of inquiry that are situated and contingent and that nonetheless seek new ways of understanding experience by transcending what is already known.

Innovation is expected in scientific experimentation by each new insight displacing what was previously known. We are habituated to think that knowledge is an object that can be transferred from one individual or institution to another. Such a metaphor underpins the notions of “knowledge transfer”, for example.

However, artists such as John Cage (1995), have offered a different construction. In works such as 4'33, knowledge is not “traded”. The audience completes the work (quite literally in this particular work through the sounds they make in the absence of conventional music). In other words knowledge is co-produced/co-created between in this case composer, performer, audience and setting. In much the same way, our analysis of Sounding Drawing revealed that participants completed the work of the research, in this sense the research was co-created.

This suggests a profound change in epistemology that extends beyond research into creative practice and that is an important shift from what is conventionally understood as research. As Kester suggests, it reflects a broader interest in collective knowledge production in the form of transdisciplinary research across adjacent fields of thinkers and practitioners. It also represents a transformation in the relationship between artistic practice and other cultural fields including design, urbanism, theatre and education breaking the custodial relationship traditional in the case of the arts between the autonomy of the speaking artist in relation to a viewer who is recipient. It distributes and mobilises creative agency among networks of actors who are also participants. This marks a political shift (Kester, 2013).

The point of art is perhaps to constitute and make intelligible “those aspects of human experience that are concerned with managing our freedom as human beings” (Coessens et

al., 2009, p. 176). In this light artistic research and its metaphor in improvisation is more widely transferable to education and learning offering specific qualities as a heightened, self-conscious and accountable process, acting as a form of vital intellectual energy within human experience. It is performative in the sense that what is known does not describe and explain. It produces a form of “reality” through the research process that is developed and regulated out of the contingencies and constraints of a particular setting.

Experimentation in research confronts us with a two different, complementary ways of knowing, the one sequential and the other relational. While these are imagined differently across different philosophical traditions, they frequently appear as a duality between, on the one hand, predictive knowledge in which experimentation formulates circumstances as a problem requiring a solution or explanation and, on the other, experiential knowledge that is primarily concerned with the relationship of the individual in his/her environment, co-ordinating responses, as Goethe suggests. Even the most creative act requires elements of stability and sequential knowledge, just as the most sequential forms of knowledge, such as in maths, require intuition. Such an approach in education can overcome the false separation between sequential and relational ways of knowing.

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### **About the authors**

Professor Anne Douglas' research re-examines the role of the arts in public life. A key feature of this research practice is that it is anchored in the knowledge and skills of arts practice (a practice-led approach). Improvisation as a form of practice and way of thinking is a key thematic in her research. In 2014 Anne was the MacGeorge Fellow, University of Melbourne's Centre for Cultural Partnerships. Since 2001 she has also been the Founding Director of "On the Edge Research", a programme of art research that

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