

Chapter 1

Interactive Experience, Art and Evaluation

Linda Candy and Sam Ferguson

Abstract Art in the early twenty-first century is increasingly an interactive experience that is shared with others and in public. The use of digital technology in the arts has been used to transform the viewer into a participant and is similarly starting to transform our expectations of the experience of art. From visual and sound art to performance and gaming, the boundaries of what is possible for creativity, curatorial design, performance and exhibition are continually extending and, as a consequence, propelling the practitioners involved to examine and evaluate their practices and products as contributions to a greater understanding of the nature of interactive experience. This book, *Interactive Experience in the Digital Age*, explores the development of interactive digital art through the eyes of the practitioners who are embedding evaluation in their creative processes. Many of the interactive art system developments and the methodologies presented are relevant to the wider concerns of Human Computer Interaction as well as within the Digital Arts community. Contributors have been informed by research methods from several disciplines and have adapted them in novel ways in order to develop new strategies and techniques for assessing the experience of interactive art. With contributions from artists, curators, designers, business entrepreneurs, technologists and scientists engaged in the creative arts, this book is intended to inform, inspire and stimulate other researchers and practitioners to explore further the novel and challenging developments taking place in this field.

L. Candy (✉) • S. Ferguson
Creativity and Cognition Studios, School of Software, Faculty of Engineering
and Information Technology, University of Technology,
Sydney, Ultimo, NSW, Australia
e-mail: Linda@lindacandy.com; Samuel.Ferguson@uts.edu.au

1.1 Introduction

In this digital age, the public is increasingly drawn to the seductive power of computer technology and its ubiquitous presence in daily life to such an extent that it is sometimes assumed that there is no more to be done, and that somehow the communication devices and gadgets we take for granted have always been there and will continue to provide us with access to new experiences. And yet we have hardly started when it comes to understanding how interactive technologies are transforming the nature of our experience. Nowhere is this more so than in art.

People everywhere are encountering art installations and performances that invite their participation in a way not usual in the traditional art gallery or theatre space. Art is not only becoming more accessible and popular, as the sell out of major exhibitions demonstrates, it is also becoming more ‘demanding’ in a different sense to that of traditional art appreciation. Instead of learning about the art by prior study or listening to recordings as you follow a prescribed route through a gallery, visitors often find themselves part of the art itself, a participant in an unpredictable, surprising and intriguing situation. Moreover, some kinds of this form of art ‘behave’ in ways that are only possible because of the arrival of powerful interactive technologies and the ingenuity of creative practitioners who know how to design and construct such works.

Art as *experience*, as distinct from art as *artefact or object*, is steadily making inroads into public consciousness and, quietly as yet, influencing the norms of the wider art world. The widely held belief that art is primarily about creating objects and exhibiting them in galleries or selling them on the market is not likely to disappear entirely with the arrival of interactive art, but there is already a shift in public expectations about what is possible within an art exhibition, representing a natural evolution of the participative art that emerged in the 1960s. The agenda is changing and, although digital interactive art is in its infancy compared to the long tradition of mainstream art, audiences are demonstrating an increasing appetite for novel and surprising experiences both inside and outside of exhibiting spaces.

Art in the digital age is often still a private personal experience, but it is also often an experience that is shared with others and on public view. It has become more ‘observable’ because audiences as participants in both the creation and the evaluation of the art experience are being invited to reveal their actions and to voice their views. It is also now possible to facilitate shared experience through art systems and to study shared experience more easily in the context of research carried out by artists themselves. These practitioner researchers are including evaluation in their practice and, in doing, so establishing a new agenda for art and technology research. The digital artist in particular is concerned with the affective power of interaction rather than the more utilitarian concerns of interaction designers making products that support tasks in the work place and home.

And yet digital artists and interaction designers share a common ground. The boundaries between the Digital Arts and Human Computer Interaction are not only crossed over, but also frequently moved or *removed* altogether, as people from

different disciplines collaborate in the development of new forms of interactive art systems and new frameworks and methods for evaluation.

This common ground, and how it is being transformed, is the subject of this book.

1.2 Themes and Methodologies

Interactive Experience in the Digital Age explores diverse ways of creating and evaluating interactive art by contributors who all have an interest in exploring ways of using digital technologies in their work. A general theme running through the different scenarios described is the relationship between the interactive arts, audience participation and engagement, and experience design in public art. Many of the interactive art developments are also of interest to interaction designers and the methodologies used can be beneficially applied in both Human Computer Interaction research and the Digital Arts. One of the key aspects of the common ground they occupy is the importance of the context: for HCI researchers, this involves attention to the situated nature of digital technology research; for the Arts, this implies the working practices of the artists and performers. In both scenarios, the role of evaluation extends beyond focusing on the attributes of the artwork or artefact itself to the context of use and all the multiple layers of participative experience this implies.

A majority of topics in this book are practitioner derived rather than being defined by research goals and therefore the importance of keeping creative practice and research tied closely to the needs of practice is evident. There can be tensions between these different agendas where goals and methods are not compatible and one of the interesting features of this inter-disciplinary work is how these differences are resolved in collaborative situations. Practitioner strategies include the application of user-centred iterative design and development approaches, but with a clear difference from product design, which traditionally takes account of user preferences but not necessarily the impact of technology on performers' practices. The research described here mostly takes place in real world situations ('in vivo') outside the laboratory, although for some well-defined tasks, 'in vitro' data collection can be appropriate. The public art environments that feature in a number of these cases, are complex and multi-layered and therefore, not easy to control, but this is not avoidable if artists wish to understand the way that audiences behave when engaging with their works in public places, such as galleries, museums and performance spaces.

The subjects of the chapters to follow include:

- interactive experience and interactive art systems in relation to traditional aesthetic categories and artistic practice and the tension between the autonomous artist and the interactive artist;
- interactive system-based artworks that exhibit autonomous behaviours in an interactive context;
- ways in which artists approach working with adaptive systems and observe audiences to improve their art system designs;

- performance practices involving artists and audiences interacting in body-focused aesthetic experiences mediated by digital technologies that explore the interactions between physiological processes;
- interaction in networked improvisatory musical performance and the approaches taken by musicians when navigating a networked experience;
- audience responses that emerge through interaction with works designed for collective experience;
- theories of emotion and the state of the art in emotion evaluation for interactive digital art;
- experiences of artists and HCI researchers exhibiting interactive artwork and unique opportunities offered by a public art events for research goals;
- evaluating the audience interaction with a collaborative interactive music system in a public exhibition;
- evaluation of a public exhibition of drawings, paintings and interactive digital works by curators, artists and gallery personnel;
- collaborative creation and evaluation of a public digital media exhibition located outdoors;
- curatorial design of digital art in museum and public art contexts and the methodologies for the presentation of new forms of interactive artworks;
- experience of performing Digital Arts entrepreneurship and how evaluation is vital to turning creative ideas into business opportunities.

1.3 Evaluating Interactive Experience

Evaluation in the creation and experience of interactive art and its implications for practitioner research is a central theme that runs through all the contributions to this book. Evaluation involves establishing the value or worth of something or some process and may be carried out using informal as well as formal approaches: for example, using expert judgement criteria or systematic research studies. The evaluation exercise is tailored to a given context and the outcomes are intended for it, but it can also provide insights that can be applied more broadly. Evaluation as practised in many of the projects described in this book has a *formative* role that is directed towards improving practices and procedures as well as outcomes.

The need for evaluation here arises from the transformative nature of experience in art and the way that interactivity in the digital age has changed the audience from viewer to a new kind of participant. The approaches described illustrate the diversity to be found in interactive arts evaluation processes from documented reflective practice to evidence based methods.

This diversity is reflected in topics such as:

- what evaluation means in the context of art experience and interaction and how it runs counter to traditional views of evaluation in art;
- how evaluation plays a formative role in creating the art system or art work through making reflective practice and thinking explicit;

- evaluation that informs the creative process enables the artist as maker to understand the relationship between artworks and different degrees of audience engagement;
- understanding art experience sometimes requires systematic methods for gathering evidence about levels of engagement in support of principled evaluation;
- quantitative methods for identifying patterns of interaction and observational data yielding qualitative information about situational factors are used in parallel to achieve a rounded, richer picture of interactive art experience.

These approaches are usually dependent upon how well they serve the creative intentions and aims of the practitioners involved, including the way works are designed and made, rather than the requirements of research for its own sake.

1.3.1 Benefits of Evaluation

Understanding art better has different implications to those of typical research outcomes. Far from constricting ideas, it is likely that any new knowledge about ways of understanding art will result in new and different forms of art being produced. For many areas, the principles and factors under investigation are fixed – research into physics for instance can rely on the principles of physics that are discovered to be unchanging, or very rarely changing, and can test those principles through repeated experiments. However, for research into art and art evaluation, a fundamental principle of much scientific research, *repeatability*, is not the aim and nor is it likely to be strictly possible. The second experience of an art object is often not like the first, for an individual, a community or a historical or geographical context, so studies may give different answers each time they are applied. When an artist explores the way interaction with a particular work takes place, through observational or interview studies, the results may offer indications as to whether or not the intended effect has been achieved within a given set of conditions in a specified time frame for that particular work. The artist gains insight into how the art ‘experiment’ worked – or not – as the case may be, but this does not necessarily lead to doing more of the same. Any discovered principles concerning some particular aspect of an art object are likely to prompt deconstruction and innovation, rather than conformity within that particular aspect (Gaver 2012). It is not necessary, therefore, to fear that art evaluation will be able to codify and therefore constrain an artist to a particular way of making art – rather it is likely to provide multiple novel viewpoints and tools for artists and others to employ towards developing their work along the lines of their planned outcomes and purpose.

1.3.2 Outcomes from Evaluation

There are two types of outcomes presented in this book: new understandings and new art works or art systems.

What do artists and others understand better as a result of evaluating interactive experience?

The outcomes of audience experience studies should be regarded as exploratory in nature, often raising even more questions at the same time as they provide answers to the ones initially posed. In some respects, it is only possible to *evaluate* experience within the bounds of the particular context under scrutiny.

Overall, the studies reported in this book indicate that there is a high degree of variability and fluidity in audience response and levels of engagement with the interactive work. The contributors to this book do not claim to provide definitive answers (i.e. generally applicable across all cases) to questions about how audiences behave with or respond to a particular work, or how to make one kind of artwork more effectively than another. Rather they offer novel ways of developing highly creative art experiences, as well as describing the methods and techniques that can be used to evaluate them, most often in a formative way. They can be regarded as novel ways of mapping pathways through the complex and multi-layered world that art and our experience of it offers.

Some of findings from the studies are that:

- the inclusion of interactive art systems within live performance works has an impact on the process of development and structure of these new performances;
- the subjective and bodily nature of experiences made possible only by ‘Live Art’ poses challenges to conventional art making and exhibiting/performance practices;
- feeling part of a collaborative, creative musical process seems closely related to the sense of control that participants have over their individual contribution;
- audience responses were differentiated in terms of ‘analytic’ and ‘affective’ in relation to interactive art experience. This distinction was important to the artist’s understanding of the impact of a particular work.

Some of the art forms investigated and practised include:

- dance works that incorporate interactive large-scale projections as partners in the choreography;
- collaborative interactive gaming;
- a digital art exhibition based in presented in an augmented-reality ‘layer’ overlaid on a well-known art gallery space;
- telematic musical improvisation in small ensembles;
- swarms of robotic systems acting on the wall surface of a gallery space;
- a whole-body interaction game using digital projection undertaken within a truck positioned on a city street during a festival
- interactive digital projection artworks with accompanying retrospective exhibition and curatorial design
- interactive musical systems that may be networked in various ways, or in another case are situated within a museum space and designed for the novice musicians;
- urban-scale light projections or street sculpture works with interactive components;
- distributed art systems in which the elements interact with one another across the Internet.

As described in Chap. 13 (“Evaluation in Public Art: The Light Logic Exhibition by Alarcon”, Alarcon-Diaz et al. 2014), there are many layers to the process and the outcomes have benefit for different kinds of stakeholders

The type of evaluation study described here is one in which evidence about the curatorial, artistic and audience dimensions of a public art exhibition is acquired and then used to establish the value of a particular artefact or experience. This kind of approach to evaluation lends itself to the creation of shared values based on agreed evidence because it involves an exploration of situational knowledge. The gathering of information about what takes place, how audiences respond to the art exhibition and what curators and artists learn from the designing, making and reflecting process contributes to an understanding of what makes a successful or otherwise exhibition of art in the public arena (Chap. 13, Alarcon-Diaz et al. 2014, p. 207).

It is also important to consider the longer-term trajectory of evaluation in practice with respect of much of the work presented in the chapters to follow. In Chap. 2, “Human Computer Interaction, Art and Experience”, Edmonds (2014) points to a future in which research has become an integral part of art practice and where formal or semi-formal evaluation studies are incorporated into artists’ working lives. This is a future, he suggests, in which creative practices provide a basis for the advancement of research into human interaction with computers. The effect on artists of doing more such research might stimulate attention to the fundamentals of human cognition of the art system but (hopefully) not to replace controversial and unexpected artworks with consumer-led, predictable art. He speculates that better informed artists will be more able to choose to disturb or confuse audiences as well as making art that relaxes and delights them if they so choose. Interaction designers may also have a great deal to gain from venturing into the artist’s territory by employing the capability of new forms of technological wizardry to the exploitation of creative impulses. If Edmonds’ view of the future is right, a more informed understanding of creative interaction gained from the digital interactive arts, will become more central to HCI research.

The contributors to this book have no doubt that this is indeed the future as their enthusiasm and dedication to transgressing the boundaries of different disciplines in a bid to create new forms of art and novel uses of computing technology indicate all too clearly.

1.4 The Chapters

Ernest Edmonds’ chapter reviews knowledge about interactive art from a historical perspective while contextualizing current research interest for interactive artists. Crucially, it poses a series of research questions that position the focus of this volume. Finally, it presents two frameworks for understanding interaction with interactive art that have been drawn from research studies with artwork audiences.

Linda Candy’s chapter discusses what evaluation means within the context of interactive digital art and proposes reasons why it is a problem for some artists.

A number of interrelated issues are covered including: developments in HCI that resonate with practice-based research and a view of art as experience as distinct from artefact centred art, drawing upon John Dewey, whose ideas are especially prescient in respect of interactive art and audience participation.

Andrew Johnston's chapter examines the way that practice-based research intersects with evaluation within the context of the creation of a large-scale dance work in collaboration with a physical theatre company. He discusses methods for aligning the goals of researchers and the artists and proposes a set of strategies for practitioners. He distinguishes between "evaluation" that focuses on the artefact and "examination" that keeps site of the broader context of artists' experience in working with interactive art systems.

Scott Simon's chapter adopts a more philosophical approach in which he focuses on the relationship between traditional interpretations of the role of the audience in art, and its changing nature in the new interactive art contexts. He proposes a methodology that provides artists with new incentives to create works without boundaries and, for example, to approach theoretical concepts such as art and beauty as opportunities to work "playfully" within these categories.

Oliver Bown, Petra Gemeinboeck and Rob Saunders discuss interactive art systems that exist as *art behaviours* in robotic or computational forms. They situate their work within the well-established tradition of cybernetic art and discuss the way five specific examples demonstrate various aspects of autonomy, by using classifications of their behaviour with the audience. This work is at the forefront of meaningful discussion on how to assess interactive art systems that are characterized by behaviour rather than appearance.

Lian Loke and George Khut's chapter describes the development, mainly through their artistic practice, of the "facilitated interaction framework". The case studies described provide insight into the way audience experience and critical reflection are combined and facilitated by the artists. The approach introduces a significant departure from familiar notions about formative evaluation in that the strategies for reflection by the audience (including documentation to enable the sharing of experience) are embedded into the artwork itself, with the aim to make experience of the art and its evaluation a co-evolutionary process.

Roger Mills and Kirsty Beilharz' chapter focuses on the evaluation of music-making for musicians. They position 'telematic' music in relation to social semiotics and cognitive linguistics, and develop a framework for evaluating such music making case studies. They introduce an image schema metaphor to structure the way that musicians think about and develop their musical interaction, and then discuss a systematic evaluation case study of a music-making session.

Nick Bryan-Kinns' chapter deals with mutual engagement and collaboration within digital networked music making, discussing the way that novice musicians can mutually engage in micro-creativity. The birth, development and sustenance of these micro-ideas, or memes, as they propagate through the constructed experience

are explored using a series of visualizations that help us to understand the judgments of the participants.

Chek Tien Tan and Sam Ferguson focus on the role of evaluation of emotions in interactive digital art. They review recent research into emotion systems in humans and the use of emotion within the assessment of interactive art. They also discuss the use of a real-time facial emotion recognizer to evaluate the experience of an interactive game, finding that this automated method closely mirrors post-play questionnaire responses.

Derek Reilly, Fanny Chevalier and Dustin Freeman's chapter discusses the integration of research into the evaluation of interaction with interactive art projects. It develops a narrative describing the process of building a public art exhibit and research project in parallel, while discussing the ethical issues that arose during the process of development.

Ben Bengler and Nick Bryan-Kinn's chapter describes a mixed method for evaluating audience interaction with a collaborative interactive music system. The system enables users without musical training to partake in collaborative music making. The approach aims to cater for audience evaluation that takes place in the context of public exhibitions. The interactive music making system is innovative and the evaluation work is unusual in public art events.

Ximena Alarcón-Díaz, Kira Askaroff, Linda Candy, Ernest Edmonds, Jane Faram and Gillian Hobson provide an account of a systematic evaluation study of an exhibition which took place in early 2013. They describe a process that used a variety of methods to evaluate the audience's experience of the exhibition design and artworks (many of which were digital and/or interactive) on display. The meticulous work of a number of gallery staff and researchers resulted in several research findings and surprises that highlight the way in which an artist or curator can use evaluation to gain new perspectives on the presentation of their work.

Stephen Barrass and Ana Sanchez's chapter describes the production of a mobile augmented reality exhibition in the Garden of Australian Dreams at the National Museum of Australia. A new technique applied was the use of online platforms to employ the augmented reality application 'Layar' to guide the evaluation of artefacts digitally placed within the gallery space.

Deborah Turnbull and Matthew Connell's chapter introduces the author's experience of how public digital art is commissioned, curated and evaluated for installation in various contexts within an urban setting. The chapter features three models for the curation of digital public art and discusses challenges that emerge from the process.

Jennifer Sheridan's chapter provides a personal first person narrative of the evolution of a Digital Arts career in business entrepreneurship. Many works and exhibitions, across a period of a decade, are discussed and contextualised within this narrative. This chapter introduces new ways of thinking and working in public art and signals the arrival of a new type of entrepreneur within the digital arts.

References

- Alarcon-Diaz X, Askaroff K, Candy L, Edmonds EA, Faram J, Hobson G (2014) Evaluation in public art: the light logic exhibition. In: Candy L, Ferguson S (eds) *Interactive experience in the digital age: evaluating new art practice*. Springer, London, pp 187–208
- Edmonds EA (2014) Human computer interaction, experience and art. In: Candy L, Ferguson S (eds) *Interactive experience in the digital age: evaluating new art practice*. Springer, London, pp 11–23
- Gaver W (2012) What should we expect from research through design? In: Konstan J, Chi E, Hook K (eds) *Proceedings of the SIGCHI conference on human factors in computing systems (CHI '12)*. ACM Press, New York, pp 937–946