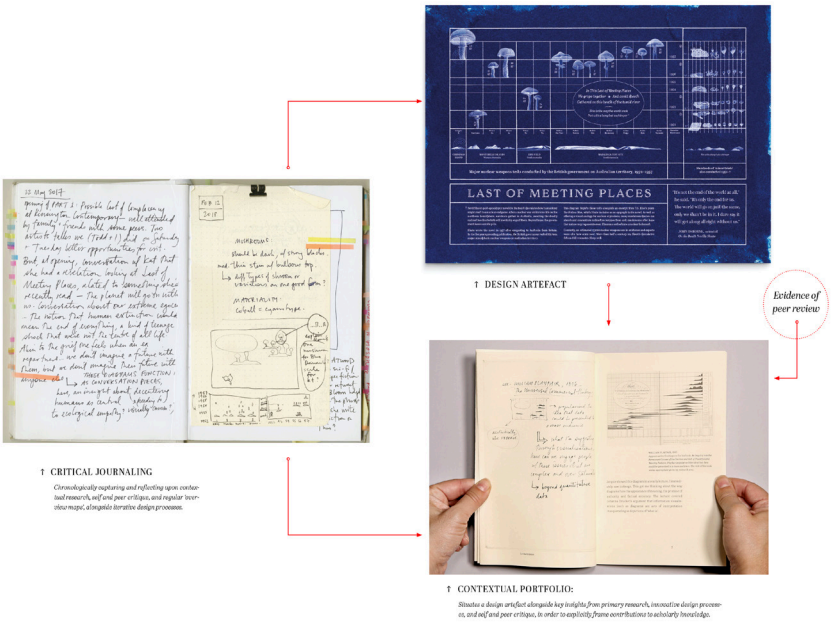
RTD

Proceedings of the 4th Biennial Research Through Design Conference 19–22/03/2019



Sadokierski, Z. 2019. 'Critical Journal / Contextual Portfolio: A framework for documenting and disseminating RtD as scholarly research'. In: Proceedings of the 4th Biennial Research Through Design Conference, 19-22 March 2019, Delft and Rotterdam, The Netherlands, Article 38, 1-16. DOI: https://doi.org/10.6084/m9.figshare.7855829.v1.

Method& Critique *Frictions and Shifts in RTD*

Critical Journal / Contextual Portfolio:

A Framework for Documenting and Disseminating RtD as Scholarly Research

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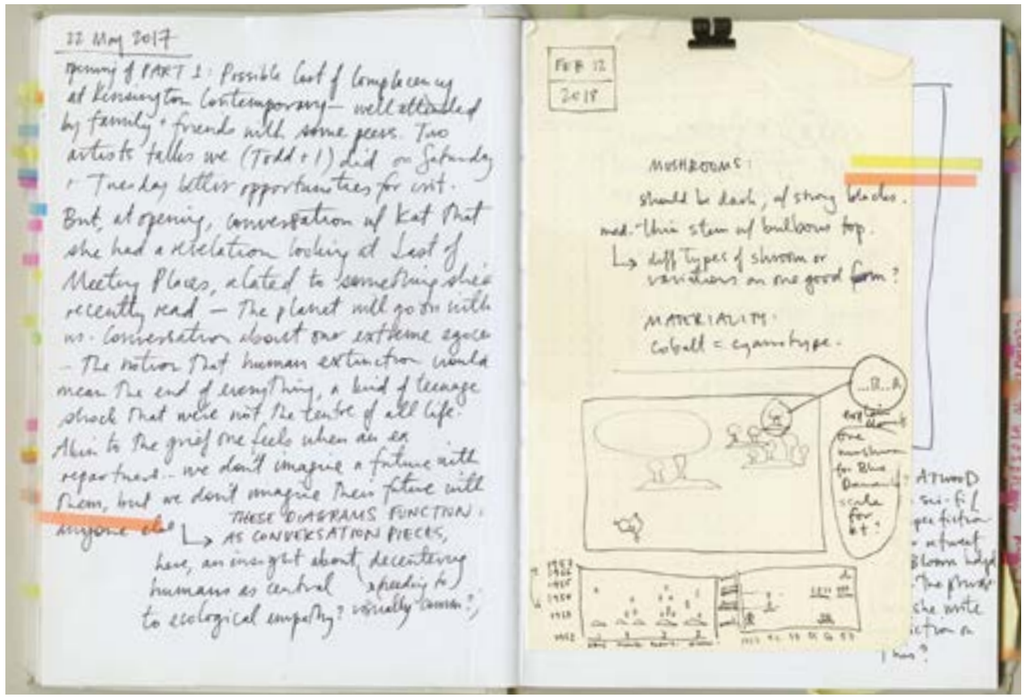
Abstract:
This paper presents a two-part framework for documenting and disseminating Research through Design (RtD) as a scholarly activity, intended primarily for designers new to scholarly research and students developing RtD as a mode of inquiry. The first part of the framework provides guidelines for documenting RtD through a Critical Journaling practice, which emphasises chronologically capturing and reflecting on: contextual research, self and peer critique, and regular 'overview maps', alongside iterative design processes. The second part argues for disseminating RtD projects through Contextual Portfolios, which situate design artefacts alongside key insights from primary research, innovative design processes, and self and peer critique, in order to explicitly frame contributions to scholarly knowledge. The framework is demonstrated using an ongoing RtD project 'Endgame'; I show how 'research data' drawn from my Critical Journaling practice is used to produce Contextual Portfolios, in order to present the research in different contexts. The paper concludes by highlighting the challenges of demonstrating scholarly rigour underpinning RtD that is 'equivalent' to traditional scholarly publications and suggests 'open access peer review' and an RtD community publishing model, supported by university presses.

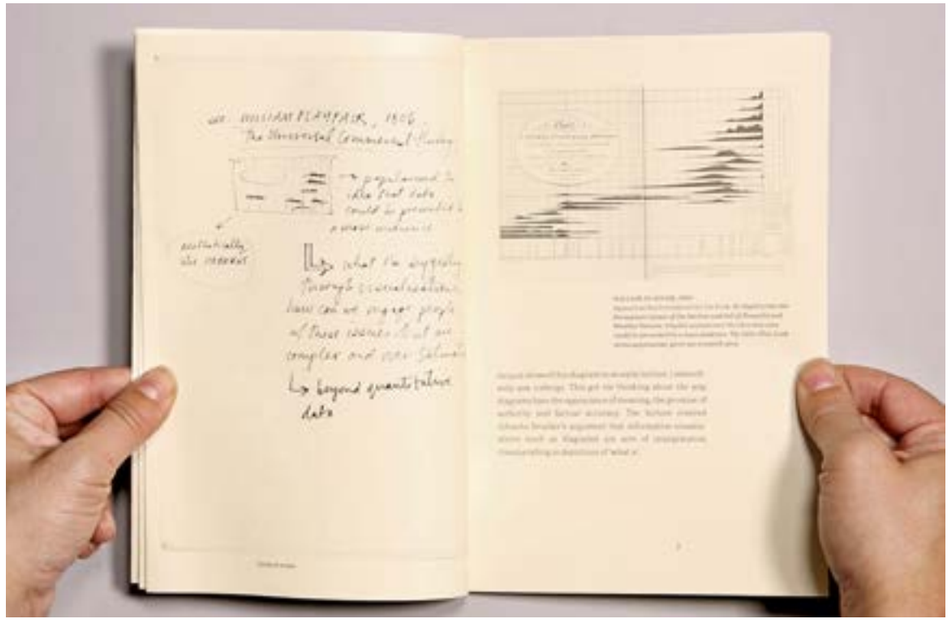
Keywords: journaling; portfolio; documentation; speculative diagrams; peer review; research through design



↑ CRITICAL JOURNALING

Chronologically capturing and reflecting upon contextual research, self and peer critique, and regular 'overview maps', alongside iterative design processes.

↑ ↑ DESIGN ARTEFACT



↑ CONTEXTUAL PORTFOLIO:

Situates a design artefact alongside key insights from primary research, innovative design processes, and self and peer critique, in order to explicitly frame contributions to scholarly knowledge.

Evidence of peer review

INTRODUCTION

Framing Research through Design (RtD) as a scholarly activity poses twin challenges. First, how to document RtD processes which are difficult to capture, such as iterative experimentation, responses to self-reflection and peer critique, and decision-making driven by tacit knowledge. Evidence of these processes is essential for reporting the kinds of knowledge production which result from RtD inquiry, yet few models for rigorously documenting such processes exist. Second how to disseminate RtD projects when traditional modes of scholarly output are designed for primarily text-based reporting, which is often an insufficient mode for communicating RtD processes and outcomes.

This paper presents a two-part framework for documenting and disseminating RtD as a scholarly activity, which I have developed over fifteen years as a practitioner-researcher and educator, drawing on existing approaches from design education and literature. The first part of the framework involves documenting RtD through Critical Journaling, a practice which explicitly aims to make connections between design activity and scholarly research. This approach to journaling emphasises chronologically capturing contextual research, self and peer critique, and regular 'overview maps' alongside the iterative design processes. The second part involves disseminating RtD projects through Contextual Portfolios, which situate design artefacts alongside key insights from primary research, innovative design processes, and self and peer critique, in order to explicitly frame scholarly contributions to knowledge.

The framework is presented as repeatable but not definitive; it is a working model that I invite feedback on and appropriation of. It is targeted at established designers who are transitioning to a scholarly research practice, and students – and their supervisors – developing a systematic and rigorous RtD practice. This framework is designed for an individual RtD practice, not collaborative work, though it could certainly be adapted for teams.[1] The first section of the paper presents the two-part framework, and contextualises it amongst existing educational and scholarly approaches to documenting and disseminating practitioner research. The second section uses an ongoing RtD project 'Endgame', to demonstrate how I produce different Contextual Portfolios using material drawn from my Critical Journaling practice, in order to present the research in different contexts. The paper concludes by highlighting the challenges of demonstrating scholarly rigour underpinning RtD that is 'equivalent' to traditional scholarly publications.

SECTION 1. A framework for documenting and disseminating RtD

1.1 FRAMEWORK PART 1: Documenting RtD through Critical Journaling

The Critical Journaling Guidelines below outline three types of documentation – contextual research, overview maps and 'experiment logs'. Also include are considerations on how to capture RtD activity, and prompts for drawing out insights which build a 'credible evidence base' for scholarly reporting. There are suggestions for medium and format to capture this activity (paper versus digital approaches), but the intention is to allow individuals to develop journaling protocols that best fit their existing practice and disciplinary conventions.

1. See: Dalsgaard and Halskov 2012; Bardzell et al. 2016 for challenges associated with documenting collaborative projects.

2. These prompts are based on questions from Booth et al. 2003.

3. This 'experiment log' structure is similar to documentation methods used in Action Research and the 'lab books' scientists keep to demonstrate procedural rigour and record insights.

CRITICAL JOURNALING GUIDELINES

CONTEXTUAL RESEARCH: 'ANCHORS'

What: Succinct, critical analysis of key 'anchors' – literature/texts/projects which have influenced your thinking or processes in a significant way.

Why: Tracking when a text or theory inspires an approach to practice or a particular experiment, or when a design process leads to a new understanding of a text or theory, can later provide evidence of innovation or original thinking, and demonstrate when design practice functions as a mode of inquiry.

How:

- Critique of citation/metadata.
  Who is author/designer?
  Is the publication date or source significant?
- Short summary of text/project.
  What argument/s is the author making?
  What is the project about or how does it work?
- Critical analysis of the text/project.
  Why is this text or project relevant to your research, what did you learn from it, and, most importantly, what did it lead you to ask or do? †

PROGRESSIVE 'OVERVIEW MAPS'

What: Regular, succinct summaries of the research project, to capture your current thinking/making.

Why: Regularly pulling back to 'map the big picture' – *the research foci, project aims and compelling questions as you understand them at a particular moment* – helps maintain perspective 'in action' and captures the evolution of a project for later reflection.

How: At the start of a project, decide how to create and archive these overview maps; on paper or using software. Clearly date each map and archive in a folder, file or section of your notebook. Schedule a regular time to map which makes sense for the particular project: daily, weekly, monthly. In each map, respond to the prompts:[2]

I am exploring ...
a specific topic, question, phenomenon, process

by doing ...
processes and methods

so that ...
what will people experience / know / do?
What is the relevance of this project; how does it relate to design practice, theory or the world?

EXPERIMENT LOGS[3]

What: For each iteration of the project, keep an Experiment Log using the headings and prompts below. An 'iteration' is any discrete activity conducted with a specific goal or question in mind, such as prototypes, material experiments or user testing scenarios. Archive chronologically.

Why: To record aims, processes/methods and reflections on and for action that may later be used as 'research data' for scholarly research reporting.

How: From the outset, plan how, what and when to capture processes and reflections, in a way that is logical to you. You may develop a combination of modes for capturing and archiving this activity.

a. Aims: *What are you trying to find out or test? Why?*

b. Precedents / Context: *Who has performed similar research and/or practice, or what inspired this experiment, including your own previous work? What thinking, processes or methods have you borrowed, and how does your experiment differ from their outcome or methods?* †

c. Process / Methods: *In point form, describe the method/s and processes used, include images where relevant. Note where processes/methods are borrowed or original. Plan what, how and when to best capture processes/methods before starting each experiment:*
- *What 'data' do you want to collect? Processes, output/artefacts, peer/collaborator/user responses, or a combination of these?*
- *How: photograph, voice/video record, screen-grab, write or sketch notes?*
- *When: concurrently (as you work) or retrospectively (record processes at the end of each work session).*

d. Reflection on Action: *Review your processes and methods. Reflect: Is what happened what you expected; why/why not? How and why did the methods/processes shift as you worked? What insights did you gain through this experiment? Has this experiment led you to think differently about the precedents, your previous experiments, readings or theories? Has this experiment shifted your research focus, aims or question?* †

e. Reflection for Action: *Based on your reflections, what might you do differently or next? This reflection should drive the next experiment.*

† *These sections are crucial; capturing the interplay between design practice and texts, theories, other RtD projects provides a basis for reporting a scholarly research agenda and demonstrating rigour.*

1.2 FRAMEWORK PART 2 – Disseminating RtD through Contextual Portfolios

The 'Contextual Portfolio' aims to explicitly communicate the scholarly research within a RtD project. Using 'research data' from the Critical Journal, it is a synthesis document, drawing together research aims, key insights from literature and design precedents, iterative design processes, and self and peer critique.

Like the Journal, the Portfolio can take many forms and incorporate a range of media – print or digital, text, static or moving image, audio-visual and interactive elements – depending on what best structures the argument, and evidences innovative processes or artefacts. The type and quantity of material included will depend on the audience, and publication/distribution platform. For example, a Portfolio targeted at a community of experts may include less disciplinary knowledge (*descriptions of processes, precedents and context in which the work is situated*) than if the folio is targeted at a cross/trans-disciplinary audience. Multiple Contextual Portfolios may be produced from a single project, targeting different audiences or communicating different aspects of the project.

The document can be structured in any way that best communicates the research, but should include:

- High quality images or recordings of the design artefacts / experiences. *Captioned with 'catalogue metadata' (title of work, designer/author, date, size, material, location where relevant)*
- Project overview and significance (drawn from 'Progressive Overview Maps'): *What is it and who cares? How is the project problematic (for who, when and where)? How does it relate to a problem or phenomenon in design practice, design theory or the world?*
- Contextual Review. *Draw on analysis of literature and precedents to situate the project in a discipline or context: Who has addressed similar issues or worked in a similar way? How does your project differ from or expand upon these?* Include explanation of how this project sits within the arc of your existing RtD practice.
- Iterative design practice. *Draw on 'Experiment log' data to articulate how innovative processes, methods or insights from the design process offer an original contribution to knowledge. Use audio-visual content, static and moving images where ever possible.*

1.3 Journaling and Portfolios in RtD literature

The above Guidelines for Critical Journaling were developed (*cobbled together and continuously refined*) over 15-years experience as a practitioner-researcher and design educator. Below, I discuss how models and processes from the RtD community and design pedagogy have informed my framework.

First, it is worth considering how process journaling is taught in design education, as this is where most practitioner-researchers learn to document and share process work. Also referred to as diaries, workbooks and notebooks, journals are kept to document the various stages of the design process. Documenting inspiration (*secondary research*), ideation (*concept development*) and iterative processes (*such as design drafts, prototype and UX testing, experimentation with media and materials*) as a project unfolds allows designers to: self-critique in order to progress toward a final outcome; share iterative development with peers, collaborators or teaching staff to facilitate critique, and; provide evidence of original ideas or designs (IP). Although process journals are primarily private documents, they may be shared with educators or collaborators. For example, in the undergraduate visual communication design program where I lecture, students must submit an edited and annotated process journal alongside every project. Students are instructed to include only what 'tells the story' of the design process. Compiling the document requires critical reflection to determine which process work is significant and how to organise the content so it tells a convincing narrative.

Done well, these 'synthesis documents' provide an evidence base by which to evaluate research, conceptual development and novel processes which may not be evident in the final work itself. In other words, they mirror the Contextual Portfolios described here. Yet they are not the same genre of documentary activity. Where the primary purpose of process journaling in education or commercial design is to develop 'own practice', the primary goal of Critical Journaling is to capture the thinking and processes that are consciously, or could later be argued as, scholarly activities.[4]

Many existing models for RtD documentation focus specifically on documenting the 'black box' aspects of design practice (making, and reflections in, on and for making). Industrial designer Owain Pedgley (2007) states that "the autobiographical nature of practice-led research involving self-accounting and self-analysis coupled to inherently personal design processes, demands that special attention is paid to achieving methodological transparency" and calls for "systematic and effective methods for capturing and analysing own design activity, so that the resultant data may be used as credible evidence base for practice-led research in design." (2007: 480) Pedgley provides a detailed account of developing a documentation process which includes both 'cerebral' and 'externally perceptible' activities. However, Pedgley's approach does not explicitly account for documenting the ways contextual research or theory may inform, or be informed by, an iterative design practice. My framework foregrounds documenting how practice informs and is informed by literature and design precedents (*see the sections marked with* †).

Similar to Pedgley's idea that journaling produces 'research data', a collective of scholars from the universities of Indiana (USA) and Aarhus (Denmark) argue that systematic and comprehensive documentation of RtD provides a "key raw material out of which [academic] knowledge is constructed." Bardzell et al. critique existing models for documenting RtD, concluding that these models "variously shed light on different aspects of the problem, but each is also incomplete." (2016: 97) In other words, despite the recognised value of documenting RtD processes, there is no comprehensive model for doing so.

From their study of existing models, Bardzell et al. point to three key 'concerns' when evaluating RtD documentation. First, of providing equal support for design and research activities. My progressive 'overview maps' require the practitioner-researcher to periodically 'pull back' and examine the practice in relation to the research context. Reflections *on* and *for* action prompts in the 'Experiment Logs' explicitly include reflections on how literature and precedents inform, and are informed by, design practice.

Their second concern is the performativity of the documentation: "Documentation is not merely serving in an instrumental capacity to report on facts and findings; it is also generative in that it 'talks back' to us as designers and researchers." (106) The Critical Journaling

[4] Recent publications from Interaction Design researchers distinguish between 'first order knowledge', pertaining to specific projects, and 'second order knowledge' – how insights and understandings revealed through the design process can be articulated as generalised knowledge. (Löwgren 2013; Bardzell et al 2016).

framework I propose foregrounds journaling with critical intention – not only to record design and research activity, but to rigorously critique that activity as an intrinsic part of the RtD practice.[5]

Their third concern is for the medium of documentation (*e.g. images, text, audio-visual*) which are "often aggregated, disaggregated, and re-aggregated for different purposes (e.g. to support design ideation, to pitch a direction to a client, to trace the emerging rationale of a project)." (98) I address aggregation, which I refer to as developing a research narrative, through Contextual Portfolios.[6] The specifics of my approach sit somewhere between the Annotated Portfolios suggested by Bill Gaver and John Bowers (2012) and Jonas Löwgren (2013), and the exegesis accompanying a design artefact in a research degree.

Gaver and Bowers propose the 'annotated portfolio' – a collection of photographs of artefacts, annotated with brief captions – as "a means for explicating design thinking that retains an intimate indexical connection with artifacts themselves while addressing broader concerns in the research community." (2012: 43) Despite giving a strong argument for the value of the portfolio as an illustrated demonstration of design artefacts and processes, and importantly, one that is familiar to artists and designers, the authors recognise their examples feature 'extremely succinct' annotations, which should be significantly expanded for an academic audience. These annotated portfolios may be appropriate for an audience of experts, in particular when the artefacts are single objects or collections of objects whose function and innovation can be understood using few images and words, but for RtD that responds to or demonstrates theory, or is targeted at multidisciplinary audiences, such succinct reporting is insufficient.

Gaver and Bowers express concern that adhering to scholarly conventions – making their research contributions "look a bit more like commonly understood versions of research" – something is lost from design practice: "is the result still design, or have we lost something in the process?" (42) However, if the research narrative within a portfolio is only comprehensible to a small community of experts, it shackles the potential impact and contribution of the work. Using at least some familiar conventions while reporting RtD projects in a scholarly context – such as clearly pointing to research questions, methods/processes and precedents – demonstrates the scholarly research to a broader audiences, including design researchers who are not themselves practitioners.

My Contextual Portfolio structure borrows from the structure of research exegeses,[7] so that non-practitioners or practitioners from other fields can understand the research context. This involves identifying research aims, methods/methodologies, and situating the practice in a research context/disciplinary space.

The next section uses an ongoing RtD project,'Endgame', to demonstrate how two different Contextual Portfolios were produced from 'research data' collected from my Critical Journaling process.

5. See also Schön 1983; Quayle & Paterson 1989; and Mason 2002 for systematic approaches to developing a reflective design practice.

6. See also Lambert and Speed (2017) on crafting narratives around practitioner research

7. Hamilton and Jaaniste's study of exegeses submitted alongside practice-led research for HDR degrees identifies three main parts (in addition to an introduction and conclusion): "situating concepts (conceptual definitions and theories); precedents of practice (traditions and exemplars in the field); and researcher's creative practice (the creative process, the artifacts produced and their value as research)." (2010:31) These parts – or conventions – align with my Journaling prompts.

Section 2: Framework, demonstration through a case study

This section demonstrates how the framework was used to document and disseminate the RtD project 'Endgame', in which I create 'speculative diagrams' as a response to provocations in Johanna Drucker's book *Graphesis*. (2014) A brief overview of the project is followed by a description of producing two different Contextual Portfolios using 'research data' drawn from my Critical Journaling practice, in order to disseminate an early iteration of the project.

2.1 Project Overview: Endgame Part 1

In her books *Graphesis: Visual forms of knowledge production* Drucker sets out to establish a critical frame for understanding visualisation as a primary mode of knowledge production, at a time when "graphics of all kinds have become the predominant mode of constructing and presenting information and experience." (2014: 6)

Fig. 1: Notes on Drucker's *Graphesis* and earlier book, *Diagrammatic Writing*, in the second Contextual Portfolio, described in Section 2.2. Image: Zoë Sadokierski

In particular, while recognising that information graphics originate from disciplines such as statistics and the empirical sciences which prioritise quantitative and 'factual' statements, Drucker challenges the notion that these visual forms are a priori forms of knowledge (reductive depictions of 'what is'). Drucker asserts that visualisations are always interpretations on the part of the designer, and presents a paradox: "*Most information visualizations are acts of interpretation masquerading as presentation*. In other words, they are images that act as if they are just showing us what is, but in actuality, they are arguments made in graphical form. But paradoxically, the primary effect of visual forms of knowledge production in any medium—the codex book, digital interface, information visualizations, virtual renderings, or screen displays—is to mask the very fact of their visuality, to render invisible the very means through which they function as argument." (2014: 10, her emphasis)

In other words, we tend to read information visualisations quickly for a summary of a phenomenon or data sets, rarely considering what is omitted, or how the interpretative bias of the designer may skew the information presented. To demonstrate how visualisations function as arguments, Drucker calls for design and humanities scholars to experiment with qualitative approaches to information visualisation, approaches which aim to reveal the nuance, ambiguity and subjectivity inherent in qualitative fields of inquiry.

In response to Drucker's provocation, I considered:

> *How might I design diagrams which attempt to render visible the 'authorship' of the designer, in order to think-through and demonstrate the constructed nature of these visual forms?*

Therefore, this project is an example of RtD as a mode of inquiry – the design work (creating diagrams) is performed in order to interpret and demonstrate a theory (Drucker's 'graphesis').

Fig. 2: 'Speculative Diagram 1: Possible Cost of Complacency'. Iteration 3. Image: Zoë Sadokierski

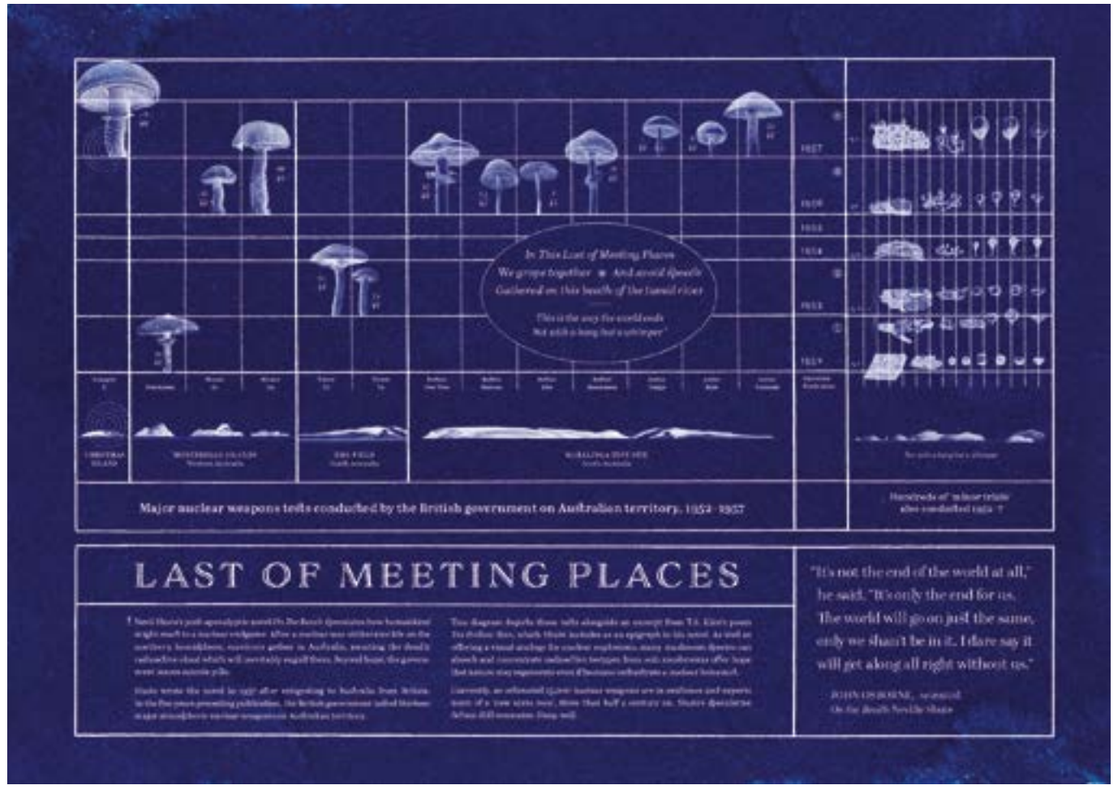


Fig. 3: 'Speculative Diagram 2: Last of Meeting Places'. Iteration 3. Image: Zoë Sadokierski

Diagram 1: Possible Cost of Complacency

I began reading *Graphesis* in late 2016, as the terms 'fake news' and 'alternative facts' were being normalised in public discourse. I noticed that many diagrams, charts and maps wallpapering news and social media forums have 'the appearance of meaning' but, on closer inspection, reveal poorly formed arguments or a lack of comprehensible data. In particular, articles on climate change – both advocating preventative action and denying its existence – rely on empirical looking diagrams to communicate authority, often without communicating much at all. Reflecting on both Drucker's provocation for experimental visualisation and this proliferation of ambiguous diagrams, I asked:

How might I create a diagram which appears to communicate something about climate change, without actually communicating anything at all, in order to demonstrate how the graphic language of diagrams can be deceptive?

I chose to visualise 'data' from a science fiction novel about climate change; using graphic language associated with empirical science to depict science fiction seems appropriately confusing. The diagram 'Possible Cost of Complacency' presents excerpts from George Turner's 1987 *Sea and the Summer*, a pioneering novel in the 'cli-fi' sub-genre, in the form of a chart. The graphical forms on the chart resemble icebergs (common illustrations for 'climate change'), but do not relate to the text excerpts or represent actual data. My Critical Journaling process led to a significant insight: diagramming science fiction alongside the science that informed it provides an alternate 'threshold of interpretation' to both the novel and the science.

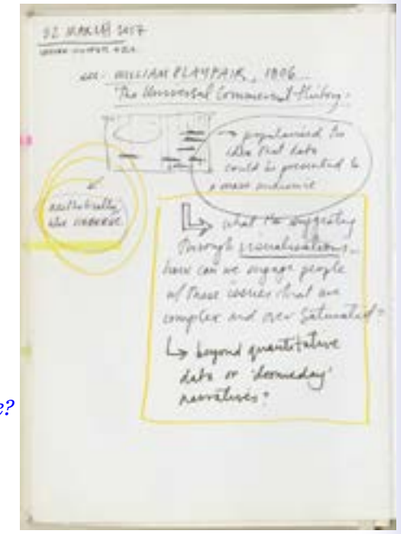


Fig. 4: Reflections in my journal, relating to early ideation of Diagram 1. Image: Zoë Sadokierski

Diagram 2: Last of Meeting Places

This led to the second experiment, 'Last of Meeting Places'. In the process of designing this second diagram, I shifted from working with 'meaningless' or ambiguous graphic elements (the icebergs in diagram one) to considering how I might embed graphic elements which function as a visual metaphor (the mushrooms in this diagram). This approach blends strategies from editorial illustration practice with information visualisation.

This diagram blends content from Nevil Shute's post-apocalyptic novel *On The Beach* (1957) with data about nuclear weapons testing conducted on Australian territory in the 5 years preceding the publication of the novel. Mushrooms are a visual analogy for nuclear explosion, but also represent hope; some mushrooms can absorb radioactive isotopes from soil – even if humankind orchestrates a nuclear holocaust, the planet can regenerate without us.

***

The project began as a way to better understand and demonstrate Drucker's *Graphesis* – a process of thinking through making. I did not start with a clear idea of final artefacts or scholarly output. I had a hunch the diagrams may be sufficiently interesting to write about or exhibit, but this was not the primary driver of the practice. I began designing as a mode of inquiry, a way to understand how diagrams form arguments, through designing them and reflecting on that process.[8]

Since 2017, new research strands have unfurled from secondary research and conversations with peers, including: *the potential*

Fig. 5: Reflections in my journal, relating to the second iteration of Diagram 2, based on further research into nuclear weapons testing in Maralinga, WA. Here, I decide to use this distinctive blue, referencing both the 'cobalt' in the bombs and also the 'shadow' print technique of cyanotypes. Image: Zoë Sadokierski

for speculative fiction to function as a tool for ecological storytelling beyond literary fiction; examining illustrative approaches to information visualisation; 'genre blending' as a strategy for 'futuring'. My Critical Journaling practice – contained within a paper journal (sketches, written reflections, data gathering, overview maps), a series of files in Evernote (long-form writing) and Mendeley (annotated bibliography) – has allowed me to capture and untangle these strands of research. Along the way, I have produced two Contextual Portfolios which document the RtD process and outcomes.

2.2 Contextual Portfolios

The two diagrams discussed above are 'articulate artefacts' – a viewer encountering them for the first time could interpret them. Yet they do not articulate my aim to interrogate and demonstrate ideas from Drucker's *Graphesis*. The design artefacts require additional support to form scholarly arguments in a substantive and defensible way. I provide this support in the form of Contextual Portfolios.

Folio 1: providing research context for exhibited work

The first two diagrams were exhibited in 2017 at Kensington Contemporary, a pop-up gallery located directly opposite UTS. I use exhibitions as a forum for eliciting peer critique of work in progress. In the context of a public exhibition, I do not assume that artefacts alone (here, the diagrams) embody knowledge or articulate context sufficiently to elicit critique on the research component of the project. In this instance, visitors may be able to critique the graphic qualities and narrative within the individual diagrams, but without understanding the work as a response to Drucker's *Graphesis*, they cannot assess how they function as an interpretation and demonstration of theory. Therefore, I produced a Contextual Portfolio to accompany the exhibited work in order to frame the research context and aims, for audiences interested in the research agenda.

This Portfolio takes a deliberately unfinished format (cheaply printed, 'clip bound'), to visually communicate that it is a process document rather than an exhibition catalogue which archives a complete body of work, as you might expect to find in a gallery. My experience in both commercial practice and design education indicates if work appears 'finished', people are less willing to give detailed critique. The Portfolio presents an edited account of my process, organised according to the Journaling content types:

a) 'Anchors' – analysis of Drucker and the novels which inform the diagrams, as well as other texts that informed the work. (*fig. 8*)
b) Research statement, extracted from my 'overview maps'. (*fig. 9*)
c) The 'experiment log' structure is used to document the design process for each diagram, with the intention to present my iterative process for critique. (*fig. 10*)

Peer critique was documented informally during the exhibition. I invited practitioners and researchers to the gallery to view, read and talk through the work with me. I reflected – through written journal entries – on conversations either immediately after (within one hour) or at the end of the day they occurred. (*fig. 11*) Some colleagues gave further critique after mulling over the work, through informal conversations in my office. I pin-up process work and jot down post-it comments during conversations, for future reflection (*fig. 7*).

8. Lambert and Speed describe the way that in creative exploration "ideas tend to emerge and develop on the move" and propose that "design researchers have the means to reposition their projects to frame premeditated research questions and objectives within their work and in some cases to apply research questions after practice has taken place." (2017: 104)

Fig. 6: Clip bound Contextual Portfolio, presented alongside exhibited diagrams at the 'End-game Part 1: Possible Cost of Complacency' exhibition.

Fig. 7a/b: Post-it documentation of informal critique in my office. 'JG' provided an extensive critique which I journaled, this is further conversation a few months later.

Diagrammatic Writing / Graphesis

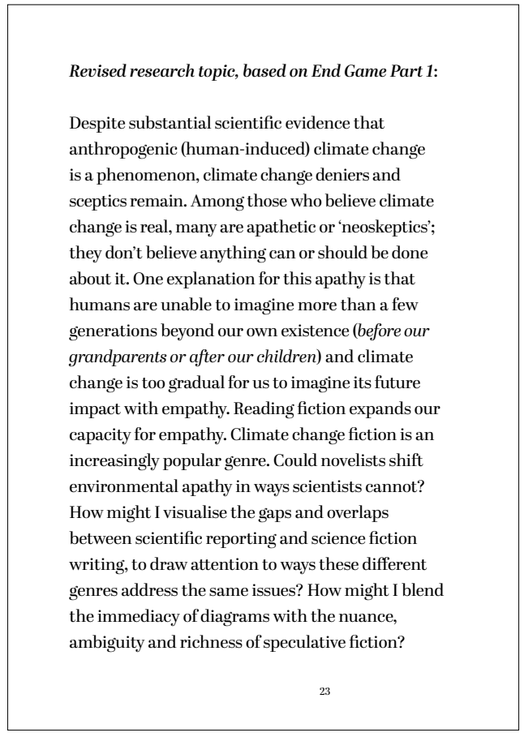
Johanna Drucker

2013 / 2014

Synopsis. In *Graphesis*, Drucker's aim is to 'establish a critical frame for understanding visualisation as a primary mode of knowledge production'. She argues that to have a critical design practice, one must understand the history of graphic forms and information visualisation. Drucker challenges the notion that diagrams and other information visualisations are a priori forms of knowledge (reductive depictions of 'what is'), instead proposing that information visualisations are acts of interpretation. In *Diagrammatic Writing* (both a book and an essay of the same title), Drucker claims the diagram is one of the most powerful visual communication forms we have to work with. A diagram is performative rather than representational, a diagram demands active engagement by the reader; we must work through a diagram in order to understand it.

Significance. Drucker argues for playful and experimental approaches to visualisation are qualitative in approach, aiming to show (rather than hide) nuance, absence and subjectivity. I took this as a challenge. The diagrams I developed are interpretations of Drucker's text, played out in material form.

Fig. 8: ANCHORS. Critique of Drucker's writing, in relation to this project.



Revised research topic, based on End Game Part 1:

Despite substantial scientific evidence that anthropogenic (human-induced) climate change is a phenomenon, climate change deniers and sceptics remain. Among those who believe climate change is real, many are apathetic or 'neoskeptics'; they don't believe anything can or should be done about it. One explanation for this apathy is that humans are unable to imagine more than a few generations beyond our own existence (*before our grandparents or after our children*) and climate change is too gradual for us to imagine its future impact with empathy. Reading fiction expands our capacity for empathy. Climate change fiction is an increasingly popular genre. Could novelists shift environmental apathy in ways scientists cannot? How might I visualise the gaps and overlaps between scientific reporting and science fiction writing, to draw attention to ways these different genres address the same issues? How might I blend the immediacy of diagrams with the nuance, ambiguity and richness of speculative fiction?

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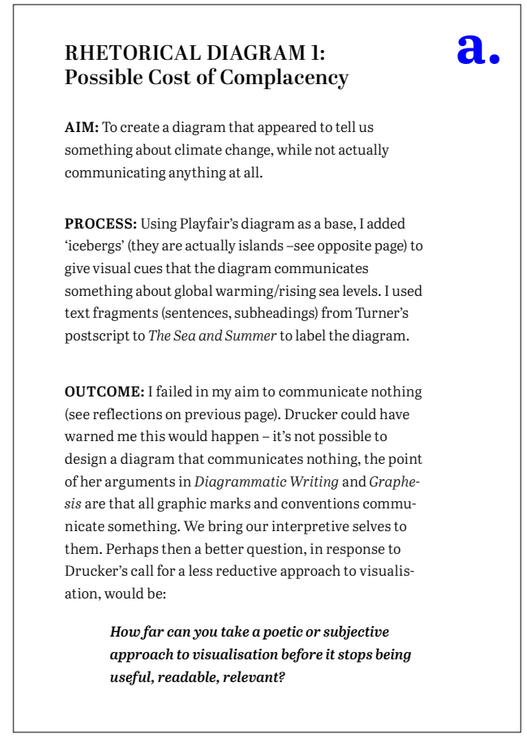
Fig. 9: RESEARCH STATEMENT: following reflection on practice and peer critique, a revised statement for the next stage of the project.



RHETORICAL DIAGRAM 1:
Possible Cost of Complacency

a.

AIM: To create a diagram that appeared to tell us something about climate change, while not actually communicating anything at all.

PROCESS: Using Playfair's diagram as a base, I added 'icebergs' (they are actually islands –see opposite page) to give visual cues that the diagram communicates something about global warming/rising sea levels. I used text fragments (sentences, subheadings) from Turner's postscript to *The Sea and Summer* to label the diagram.

OUTCOME: I failed in my aim to communicate nothing (see reflections on previous page). Drucker could have warned me this would happen – it's not possible to design a diagram that communicates nothing, the point of her arguments in *Diagrammatic Writing* and *Graphesis* are that all graphic marks and conventions communicate something. We bring our interpretive selves to them. Perhaps then a better question, in response to Drucker's call for a less reductive approach to visualisation, would be:

How far can you take a poetic or subjective approach to visualisation before it stops being useful, readable, relevant?

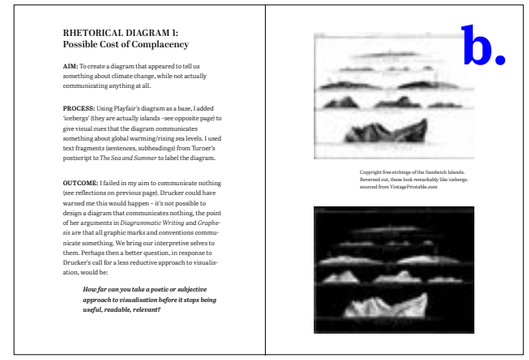


Fig. 10a/b: EXPERIMENT LOG: written account of experiment, visual support on opposite and following pages.

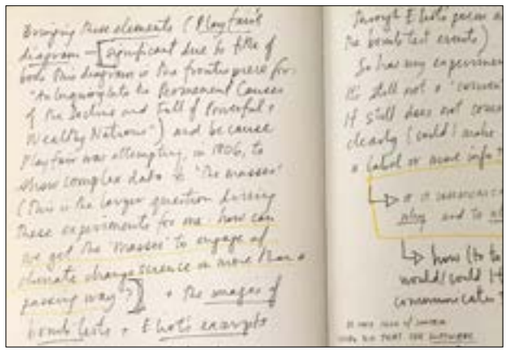


Fig. 11: Reflective journaling, following peer critique from colleagues, here I'm begining to reframe the project. (see Fig. 9).

Folio 2: Targeting research dissemination to specific audiences
Reflecting on peer critique, I revised both diagrams and produced a more comprehensive Contextual Portfolio to disseminate this first iteration of the larger 'Endgame' project.[9] This second Portfolio, produced as a print-on-demand book,[10] included more contextual material: extended critical analysis of 'anchors', evidence of where peer critique shifted my thinking, additional evidence of iterative development and a more clearly defined research questions and methodology. This Portfolio records this research in a permanent form which outlives the exhibition.

9. The self-serving purpose of this document is to provide 'closure' to this iteration (the first two diagrams), allowing me to move on with the larger project. Design practice without client or deadline can continue indefinitely; I tinkered with these diagrams, on and off, for a year between the exhibition and this publication. I would continue to do so ad nauseam, unless I defined an end point by 'archiving' the work in print form.

10. Via Blurb.com.

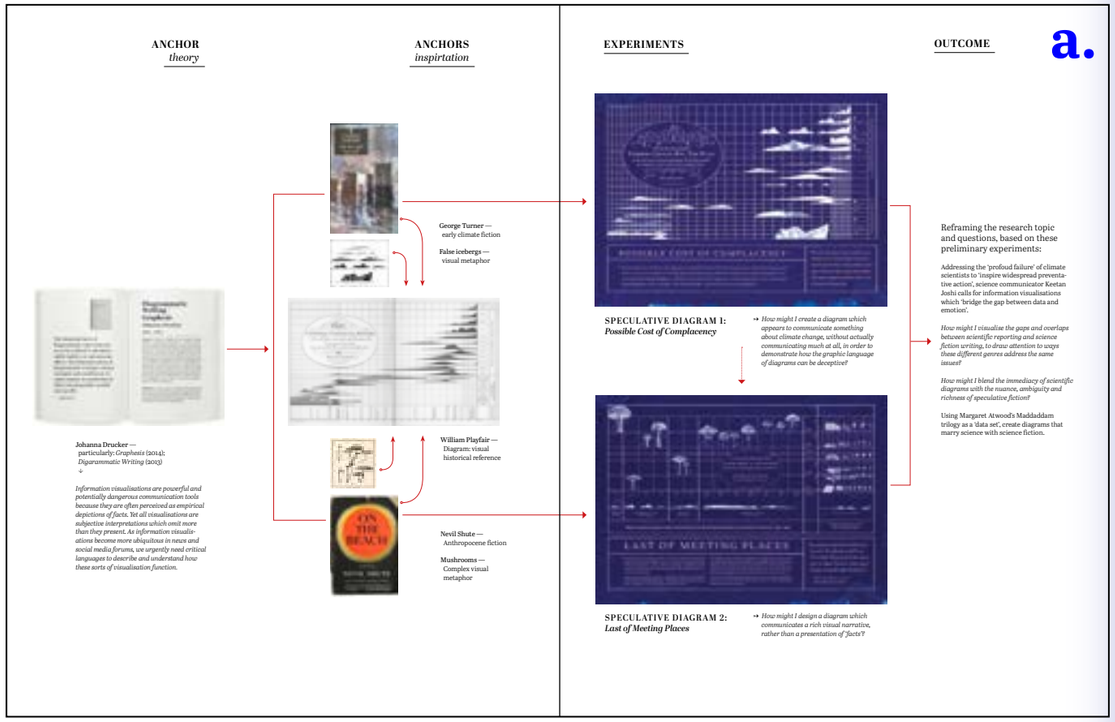


Fig. 12: Spreads from Folio 2 – **a.** Overview map, **b.** iterative development **c.** extended critical analysis.

However, as valuable as these folios are for my research practice, I have not reported the exhibition and Portfolio as research output in my university's accounting system, because I cannot demonstrate academic peer-review 'equivalent' to a scholarly journal article.[11] The exhibition was not held at a significant institution (it was a pop-up gallery) and although the curator is well respected in the fine art world, there is no evidence her curatorial 'expertise' – which may be considered a form of peer review – takes into account a research

11. Australian scholars have publication quotas, which may include non-traditional output such as exhibitions and creative work. If held at a reputable gallery, the exhibition and Contextual Portfolio may be 'packaged' and argued for as an output. Including published exhibition reviews may support the claim. Yet few galleries in Australia exhibit design, as opposed to fine art, let alone design research.

agenda.[12] Self publishing the Contextual Portfolio is, quite rightly, not recognised as a high quality research output; it lacks formal peer critique or professional editing. Although I do report peer review of the work from colleagues — who are experts in the field — it is anecdotal, rather than the structured peer review of a scholarly journal. To properly address how Contextual Portfolios may be considered high quality research output, the issue of equivalence must be addressed. This is a wicked problem for RtD researchers that I don't presume to solve; following are some conversation starters.

12. See Rust et al. 2007:60 on problems with providing evidence of peer review in exhibition of research output.

'Open Access' Peer Review and community publishing
In their article 'How a prototype argues' Galey and Ruecker (2010) describe Kathleen Fitzpatrick making a draft of her book *Planned Obsolescence: Publishing, Technology, and the Future of the Academy* publicly available via an interface, 'CommentPress', which facilitates and records public peer review in a manner similar to blog comments.[13] This process could be used to elicit and record peer review of a Contextual Portfolio for a RtD project, with some considerations. Inviting only disciplinary experts to comment would provide more credible peer review, albeit not 'blind'. The platform would need to support images and audio-visual documentation of design processes and artefacts. This process requires scholars to self-manage their peer review (scholar-led publishing), which may cause issues such as conflict of interest. The final Contextual Portfolio would still be self published, but with more explicit evidence of peer review for reporting purposes.

13. CommentPress was developed by the Institute for the Future of the Book, initially with McKenzie Wark and subsequently with other writers and researchers. See: http://mcpress.media-commons.org/planned-obsolescence/three-texts/CommentPress/

To circumvent self publishing, university presses may provide support. In 2013, I established the MediaObject book series with Chris Caines, with support and distribution via the UTS ePress. Frustrated by the inability to include sufficient audio-visual documentation to show, rather than describe, RtD processes in most scholarly journals, Caines and I edit and design each publication in a format appropriate to the content reported.[14] The books (sometimes ebooks, sometimes print, or a hybrid of both) contain extensive audio-visual documentation of design processes/performances, interviews with practitioners, and written contextual material. These publications are double-blind peer reviewed. UTS ePress hosts and distributes the MediaObject book series via the University servers and website, and contributes essential technical support, publishing protocols/expertise.

Fig. 13. MediaObject webpage.

The MediaObject publications are Open Access (OA) peer reviewed Contextual Portfolios, made more 'trustworthy' through a third-party publisher. Yet I cannot publish my own Contextual Portfolios through the MediaObject series – publishing through one's own university press is rarely considered 'high quality'. I need a MediaObject equivalent, but have yet to find one.

Therefore I propose a network of university presses and RtD scholars working towards high quality publications that aim for scholarly equivalence, without losing our process – as Gaver and Bowers fear. Just as the experimental RTD conference model was initiated by RtD scholars to address the insufficient reporting modes of traditional scholarly conferences,[15] an experimental publishing model initiated and managed by the RtD community is needed. This is not an original idea – in other disciplines, groups such as the Radical Open Access Collective are experimenting with community-led models which "offer an alternative to commercial and legacy models of publishing". (Adema and Moore 2018)

14. See Sadokierski 2017 for a detailed description of the first three books in the series. View the series at: <cargocollective.com/mediaobject>

15. See Durrant et al. 2017.

CONCLUSION

The two-part framework for documenting and disseminating RtD in scholarly contexts presented here is not exhaustive; it is offered as a guide for designers transitioning into scholarly research, or research students using RtD as a mode of inquiry. It sits alongside several existing models, expanding the literature on documentation and dissemination of scholarly practitioner research. The Critical Journaling Guidelines foreground documenting **how and where design practice informs, and is informed by, literature and design precedents**. As 'synthesis documents' Contextual Portfolios **provide an evidence base by which to evaluate contextual research, critical thinking and novel processes which may not be evident in a design artefact**.

Finding ways to invite and evidence high quality peer review in the production of these documents, when it is important to frame them as contributions to scholarly knowledge, is an ongoing challenge. I have not resolved the significant issue of 'scholarly equivalence' in this paper, but offer a proposal for discussion: to establish a network of university presses and RtD scholars collaborating to publish high quality reports of RtD projects, in formats appropriate to the practice conducted. Collectively, we can demonstrate approaches that provide 'scholarly equivalence' in providing peer review of artefacts, interactions, experiences, and other designerly modes of knowledge production .

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